

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

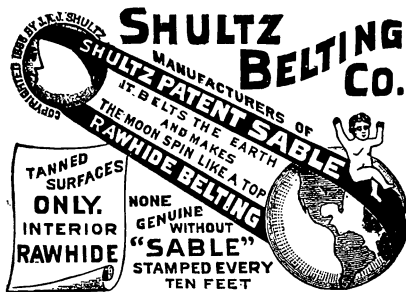
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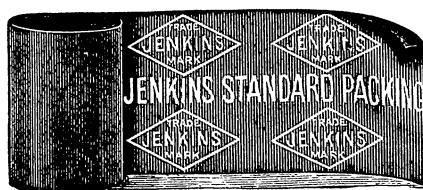
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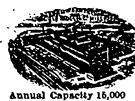
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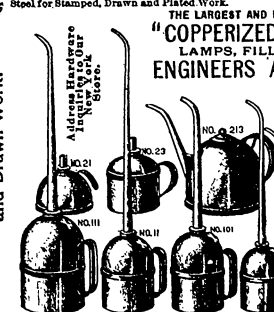
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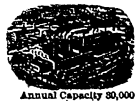
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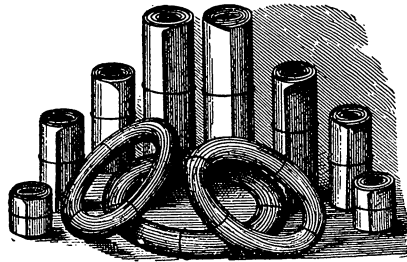
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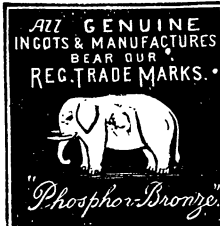
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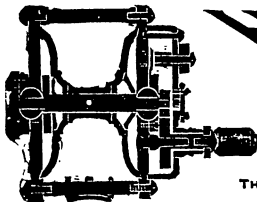
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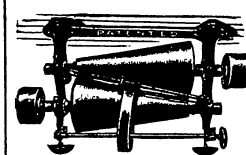
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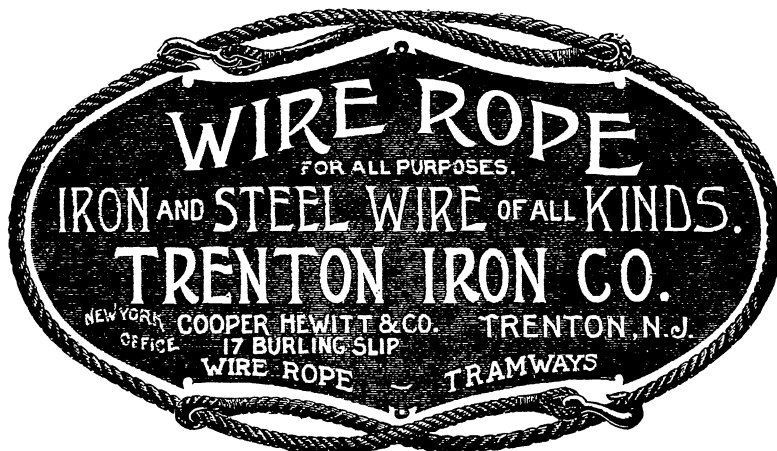
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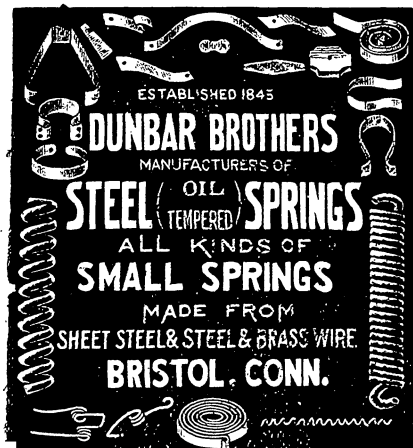


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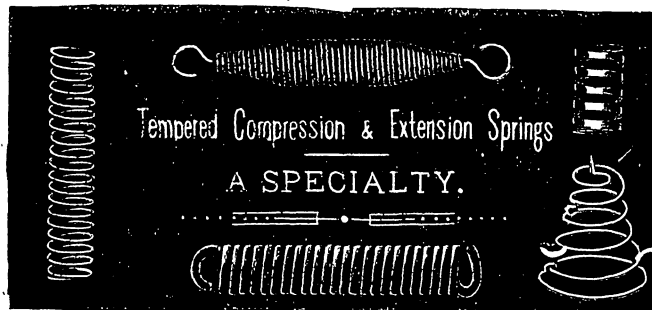


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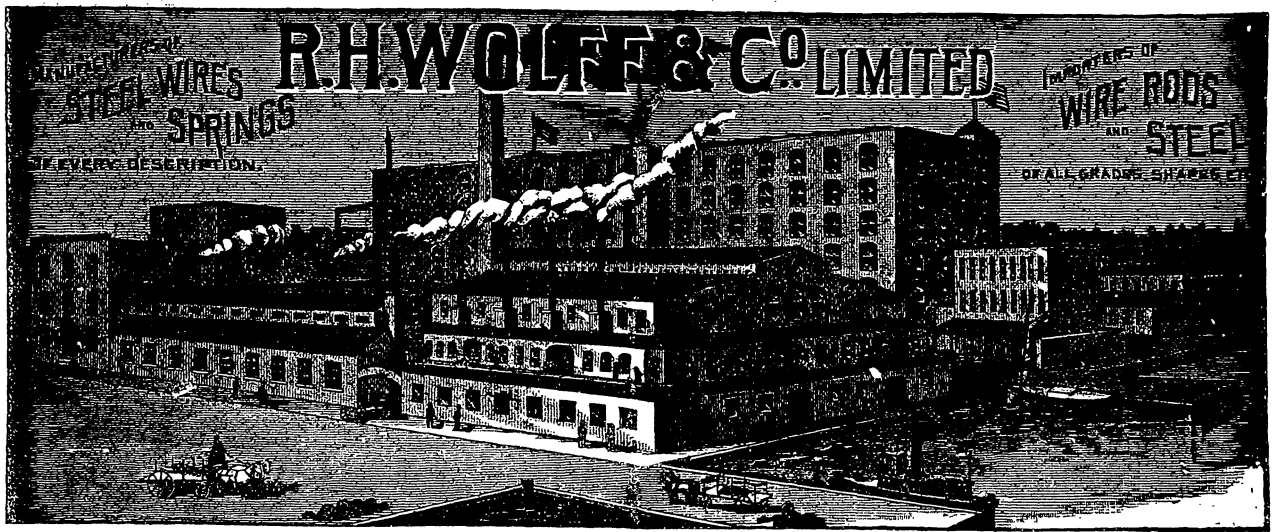


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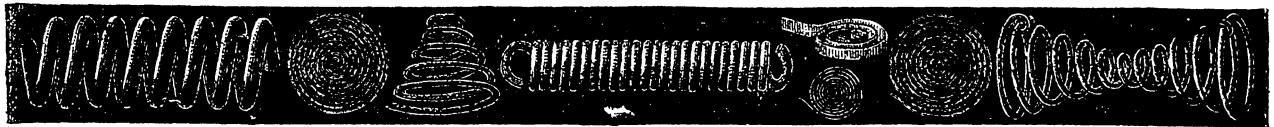
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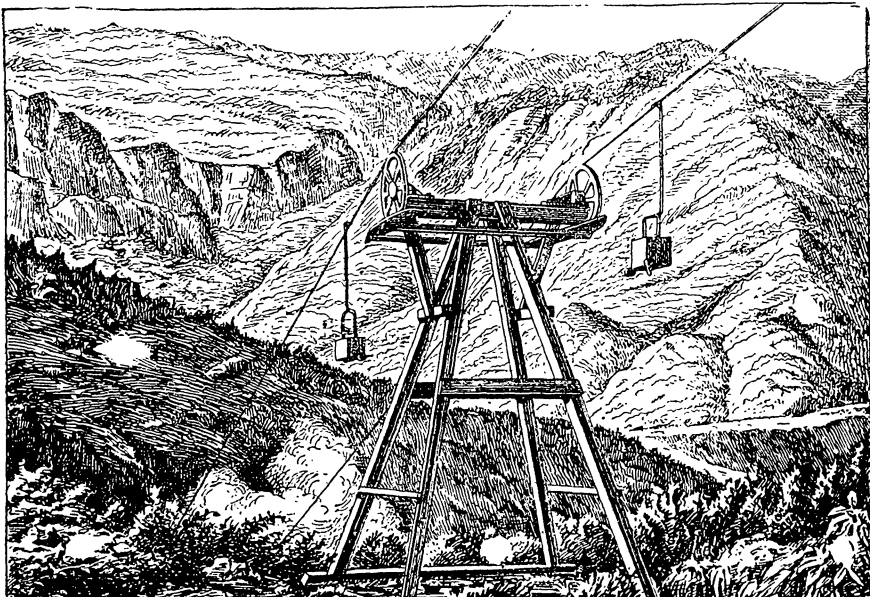
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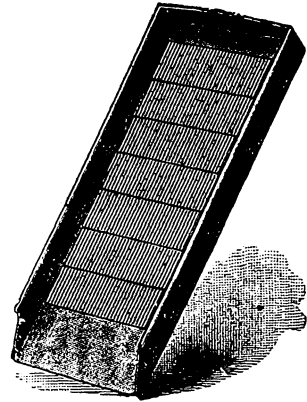
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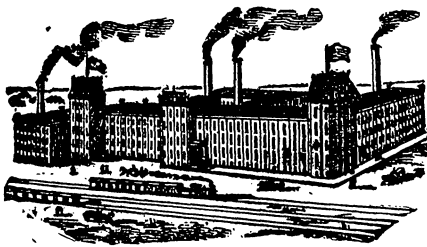
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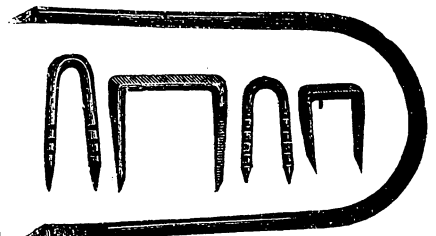
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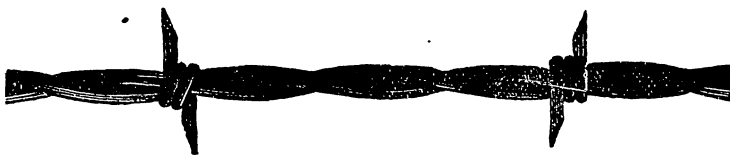
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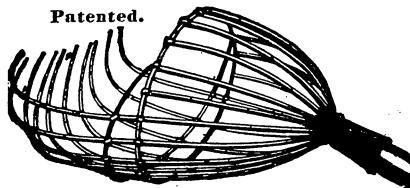
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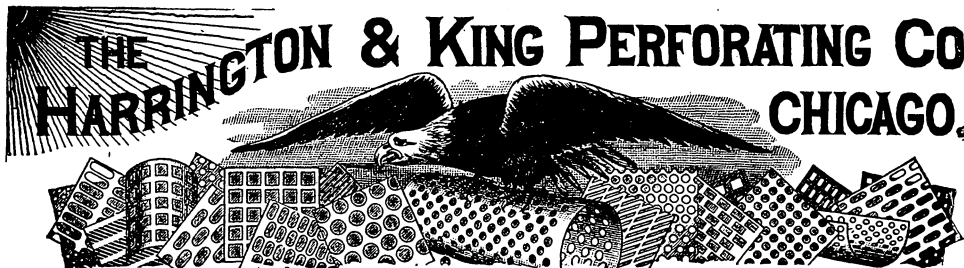
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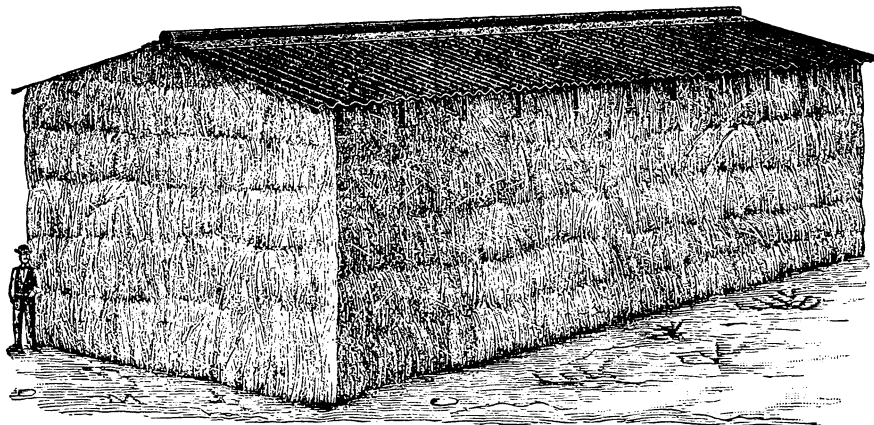
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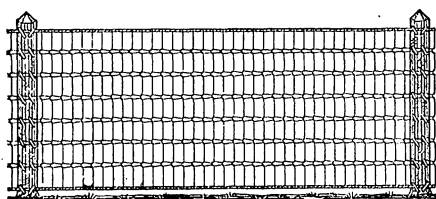
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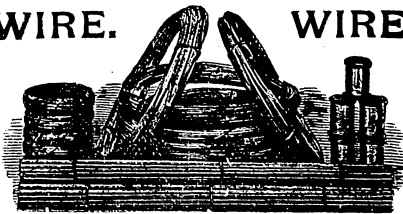
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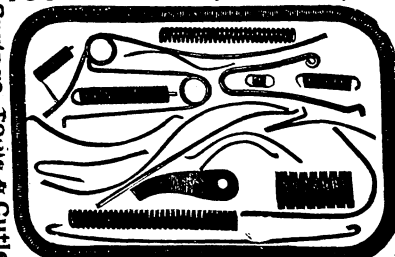


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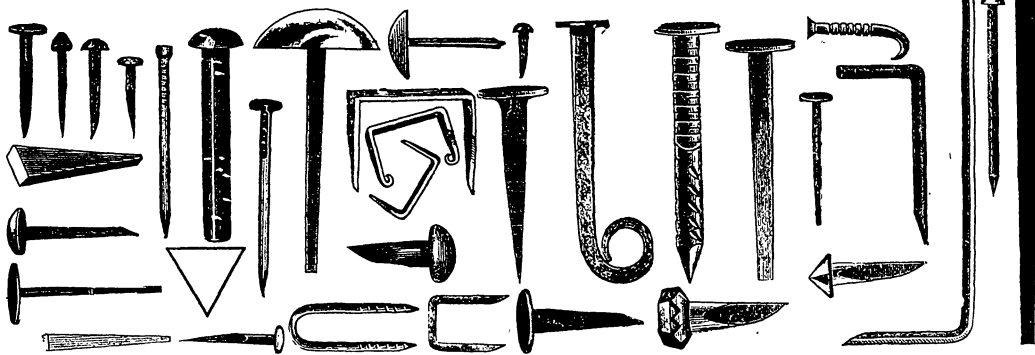
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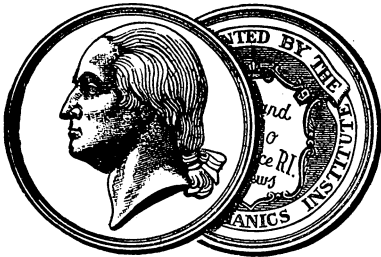
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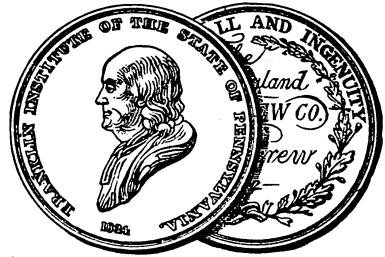
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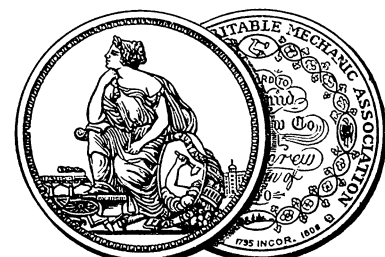
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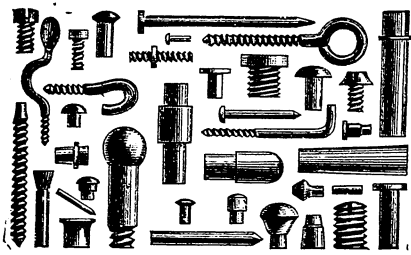
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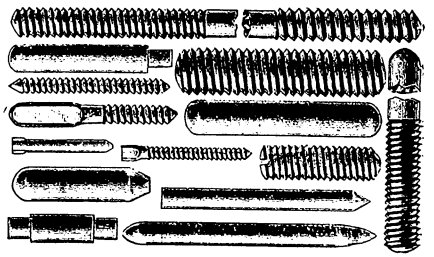


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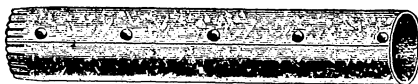
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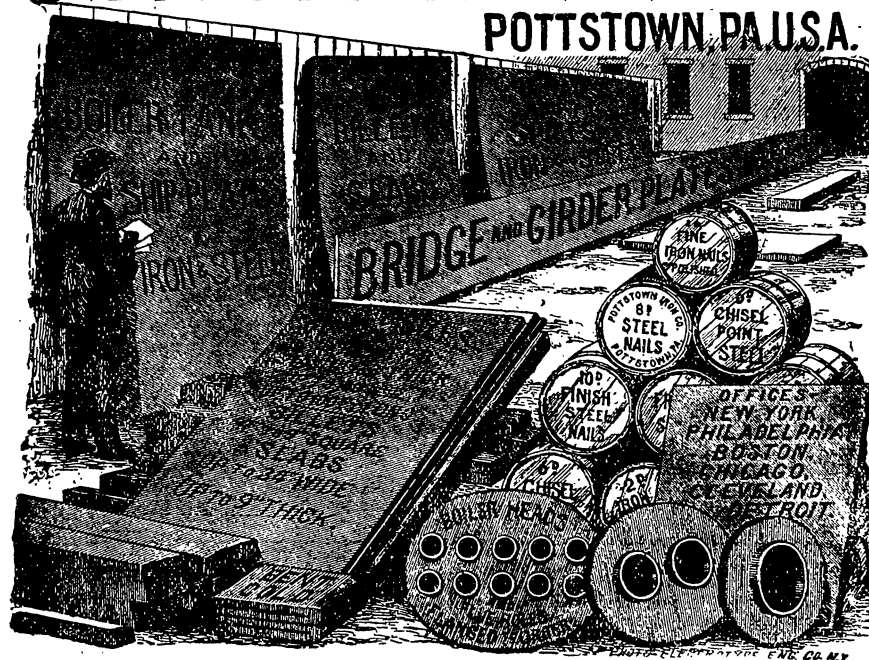
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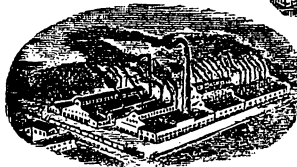
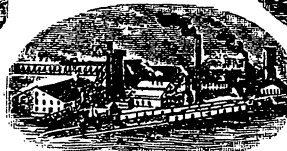
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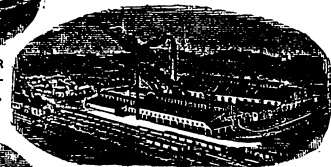
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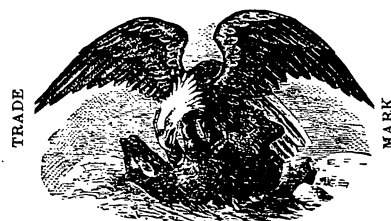
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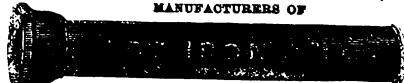
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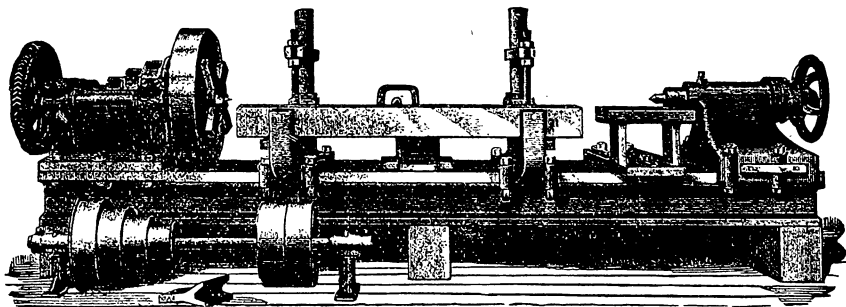
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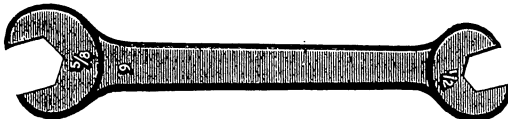
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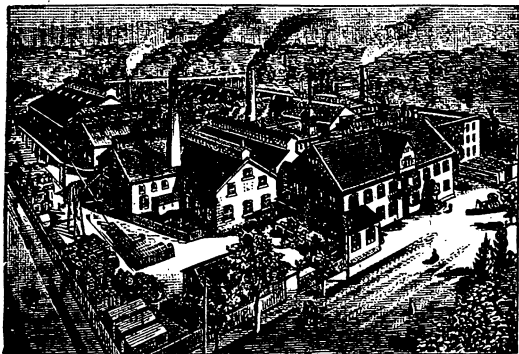
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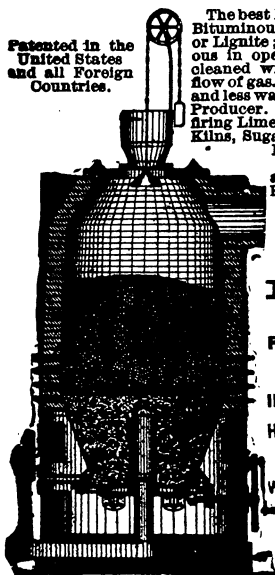
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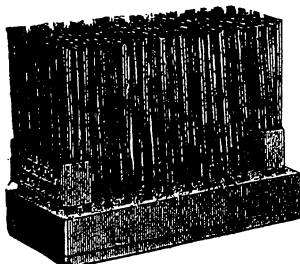
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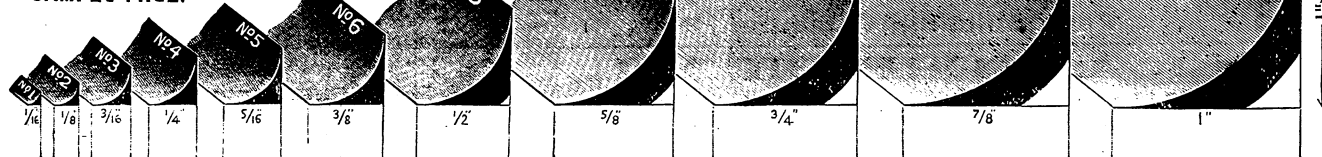
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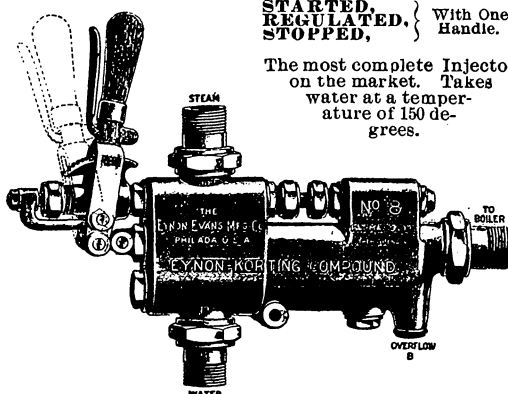
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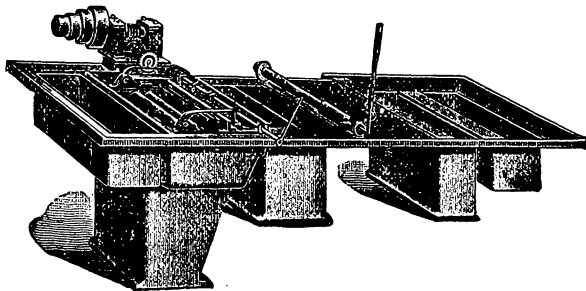
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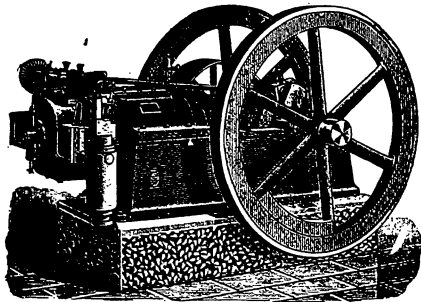
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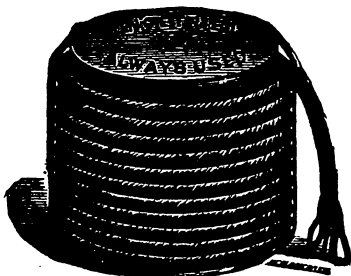
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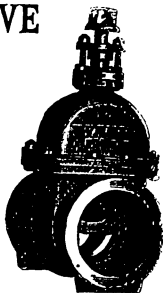
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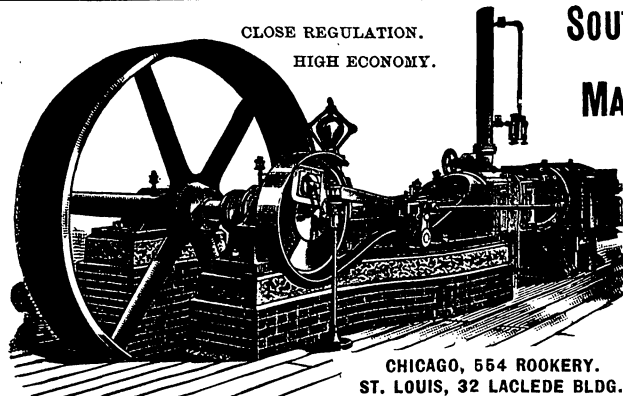
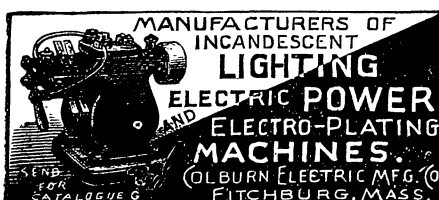
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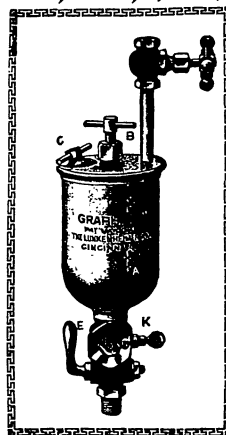
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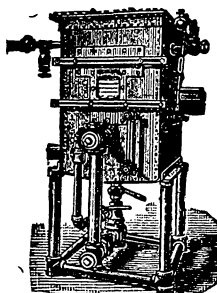
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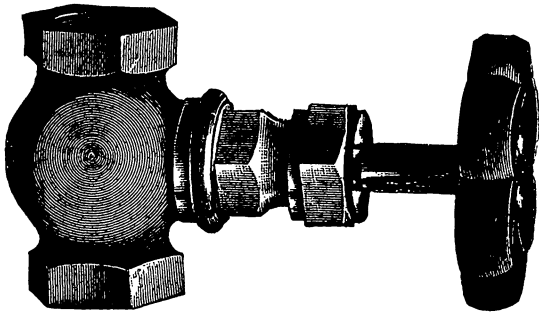


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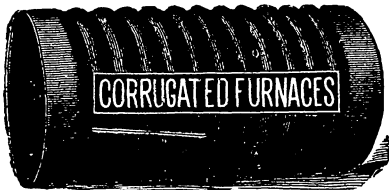
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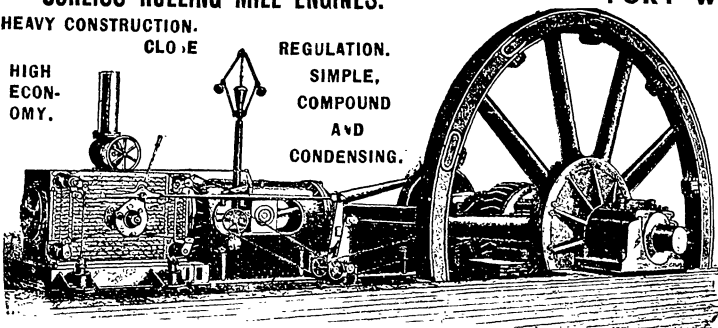
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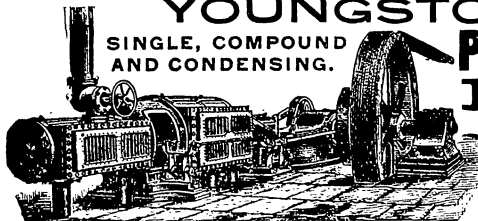
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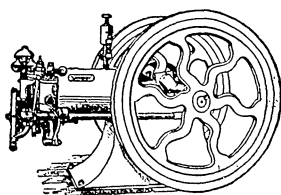
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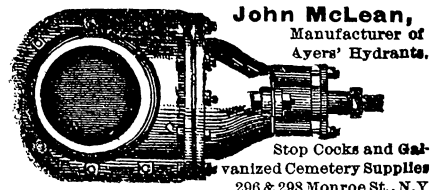
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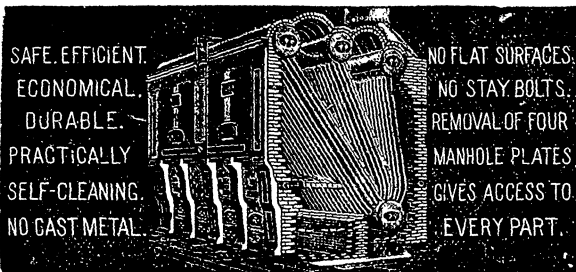


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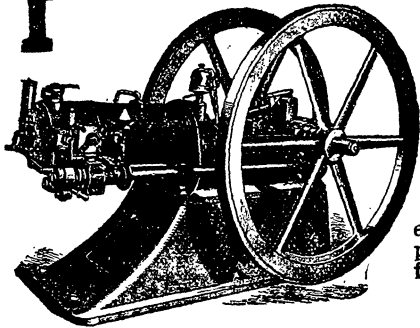


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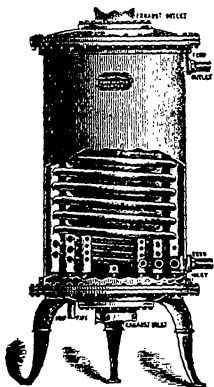
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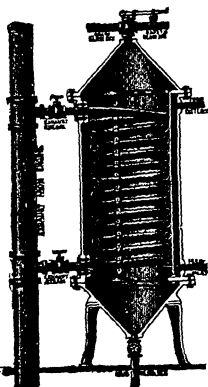
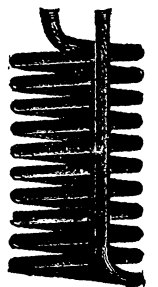


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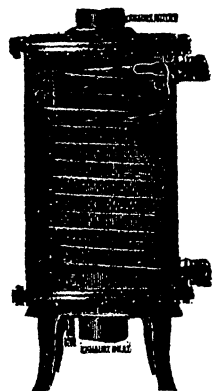
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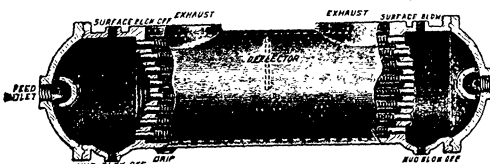
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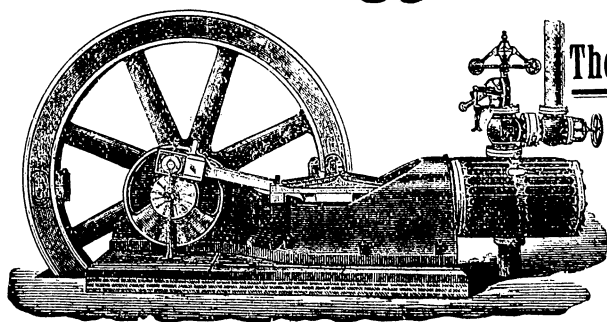
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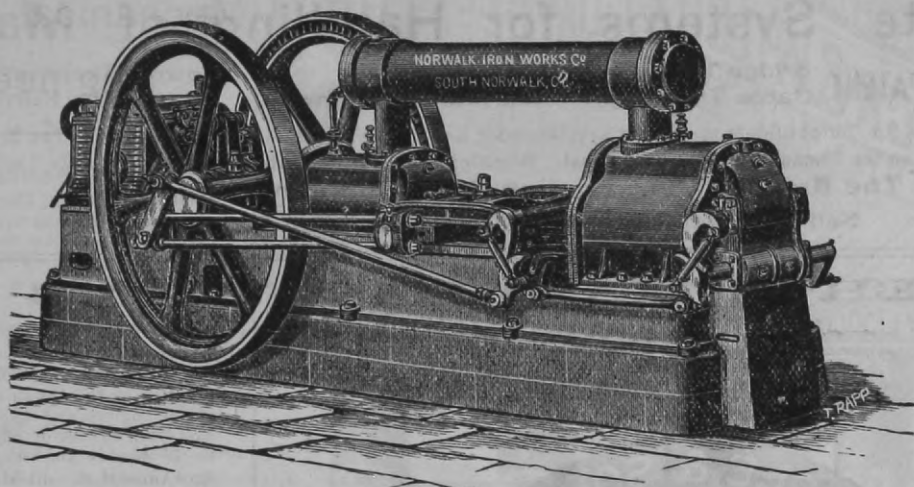
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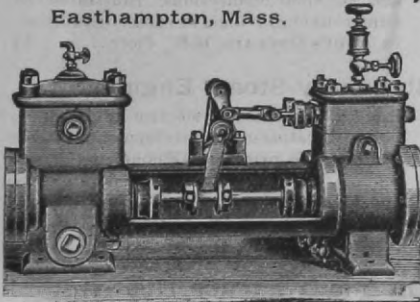
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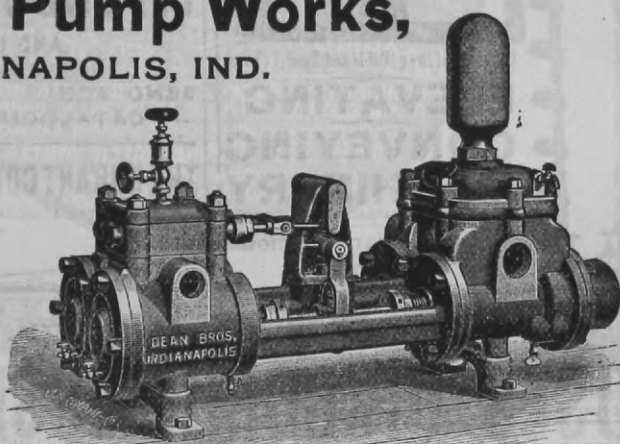


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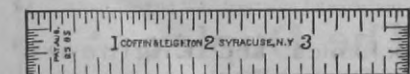
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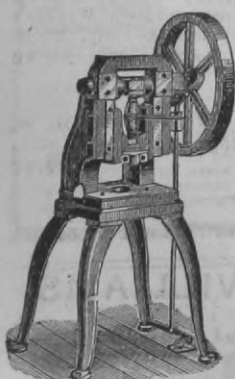
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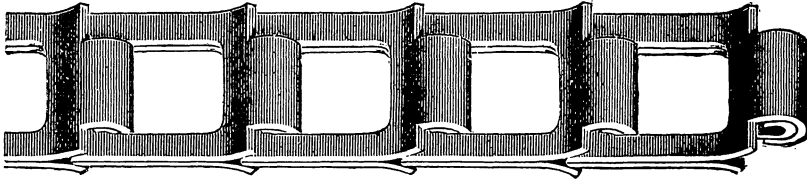
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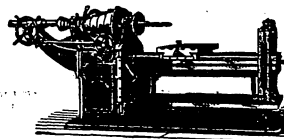
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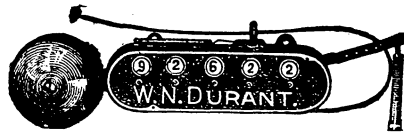
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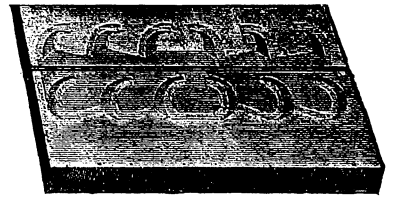
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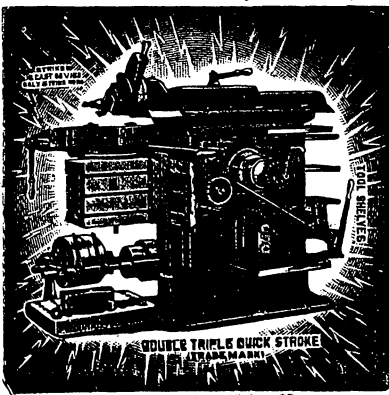


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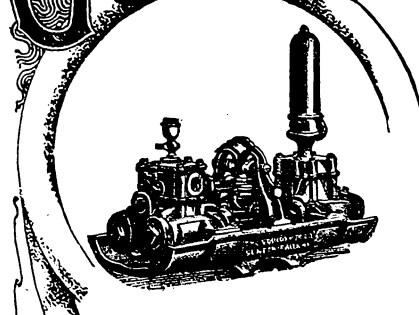
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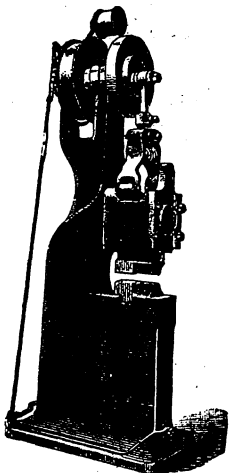
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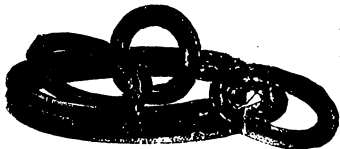
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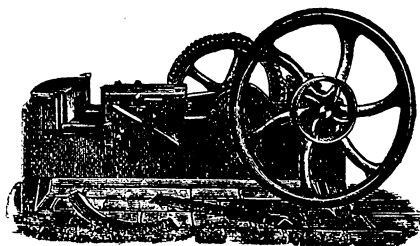
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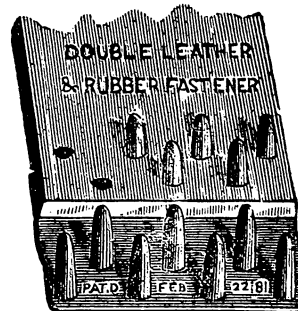
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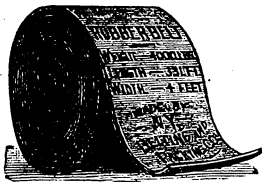
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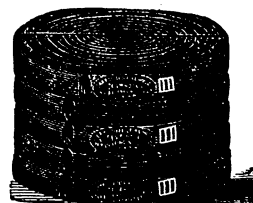


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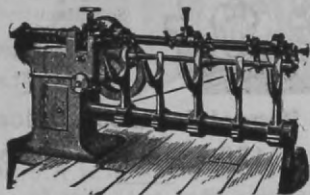
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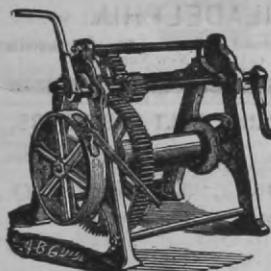


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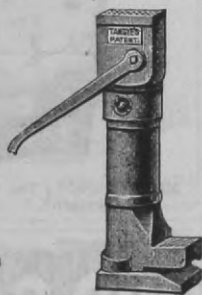
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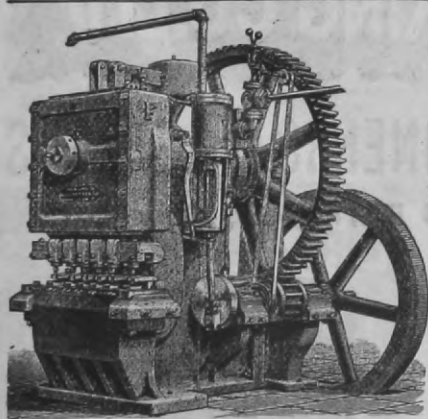
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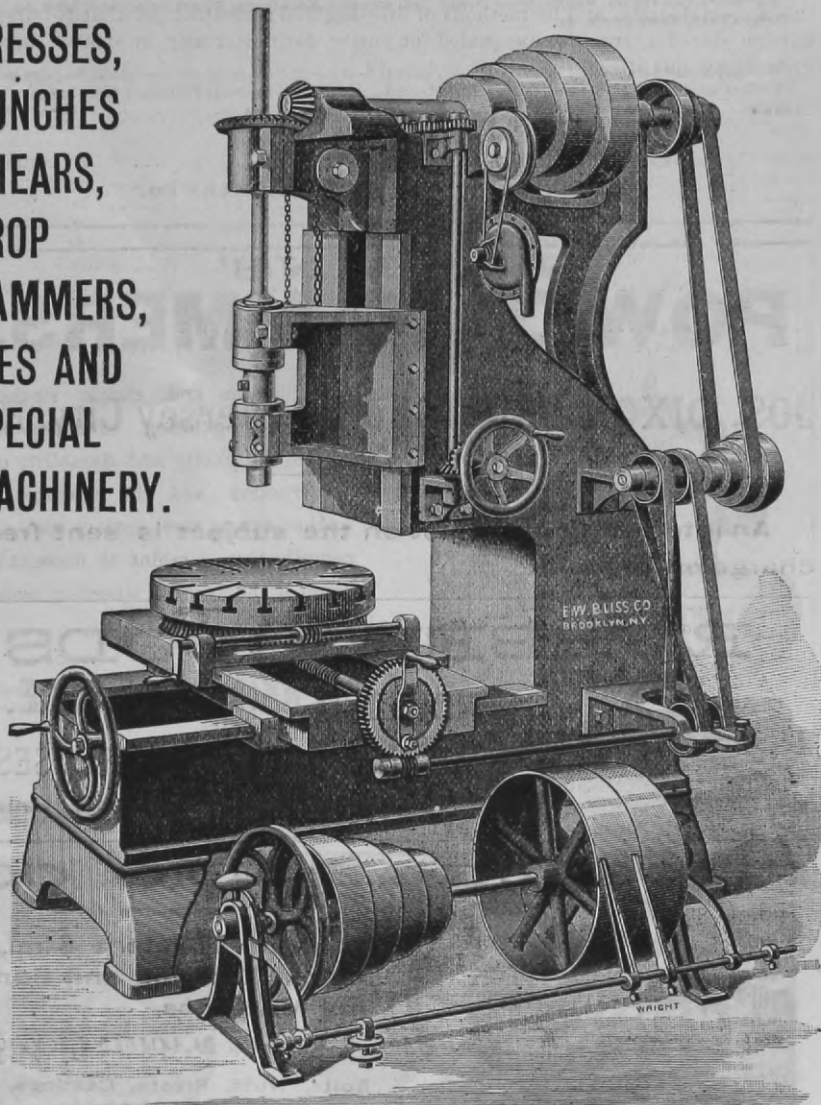
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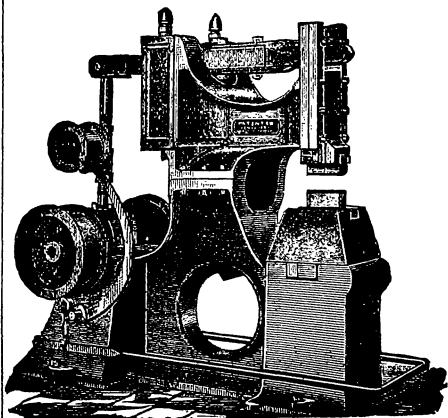
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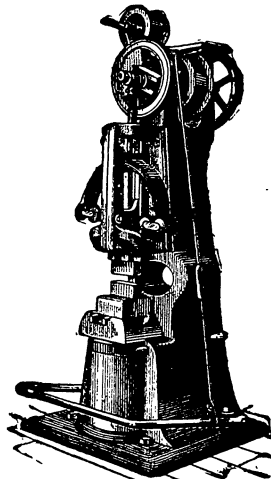


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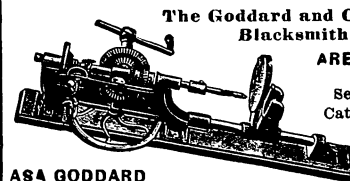
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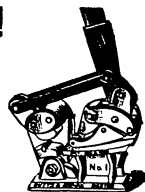


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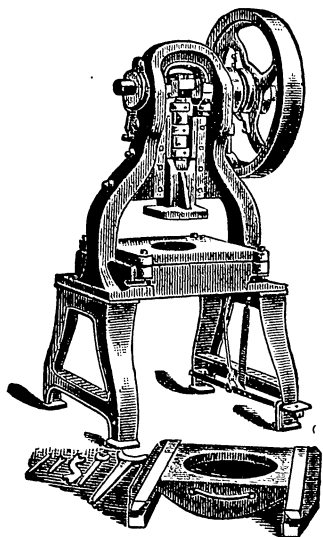
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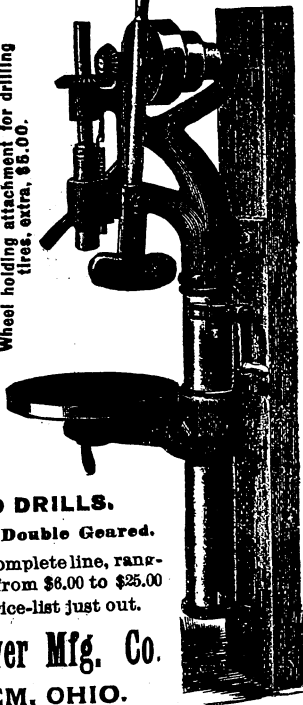
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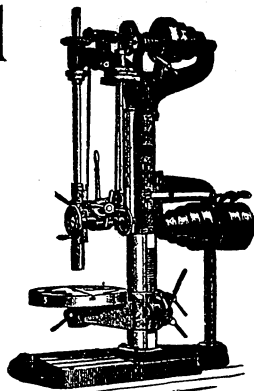
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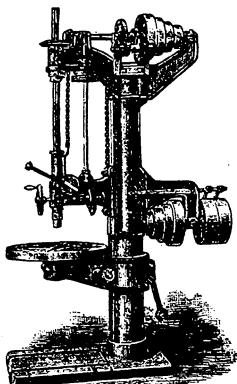
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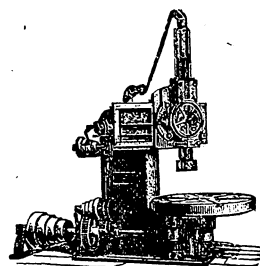


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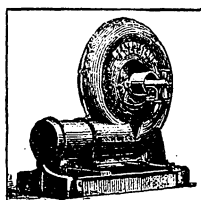
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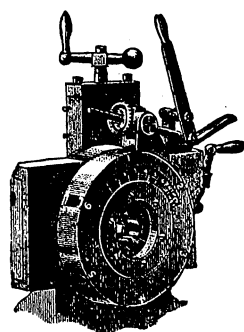
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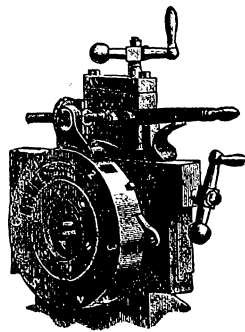
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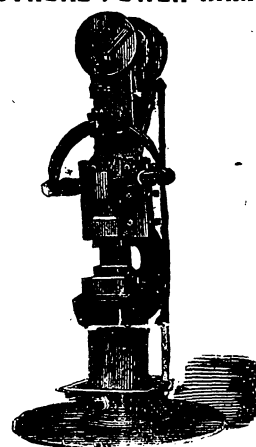
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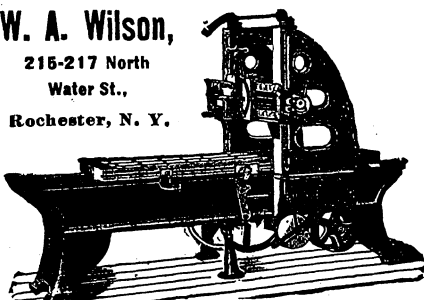
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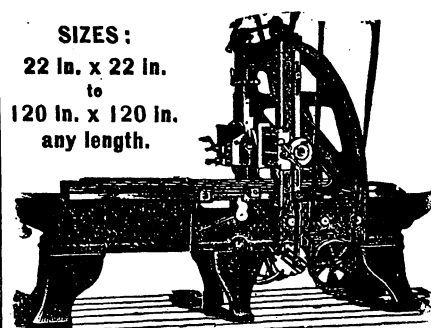
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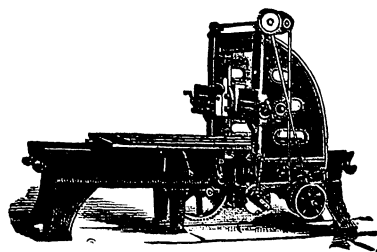
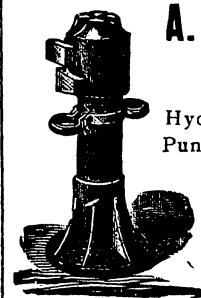
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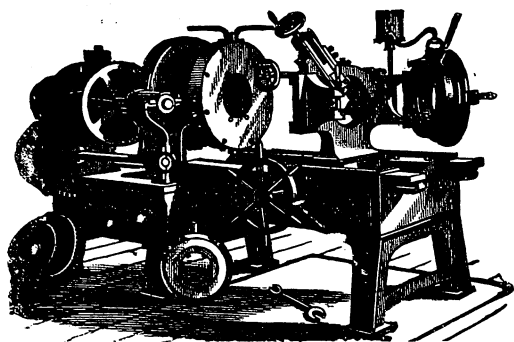
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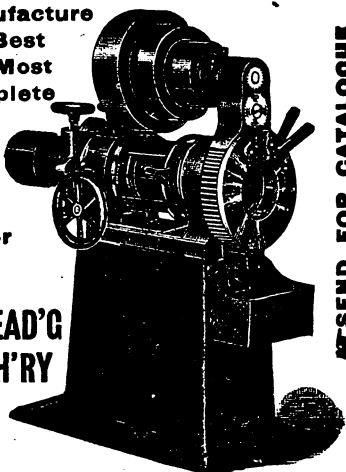
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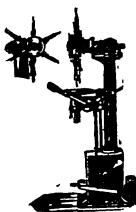
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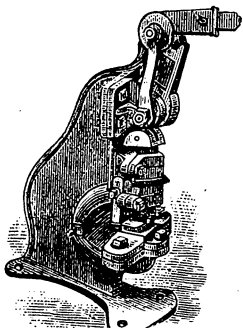


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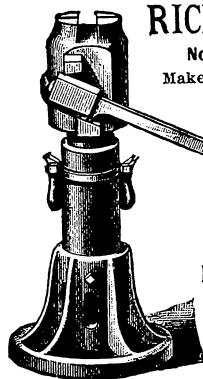
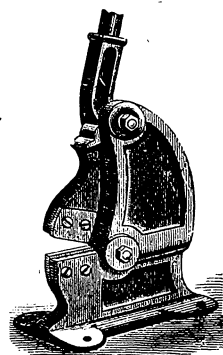
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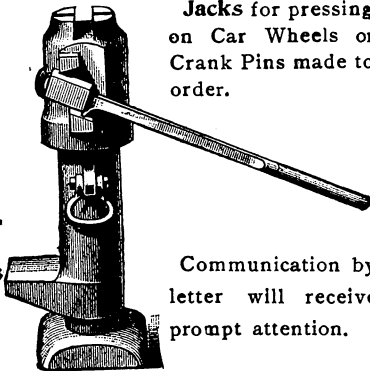
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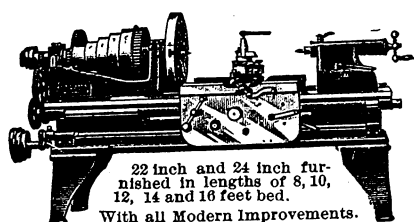
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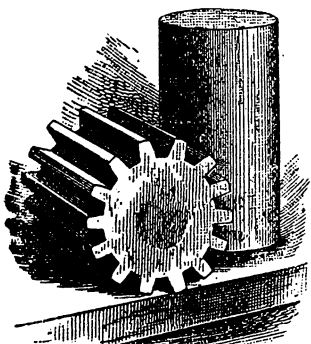
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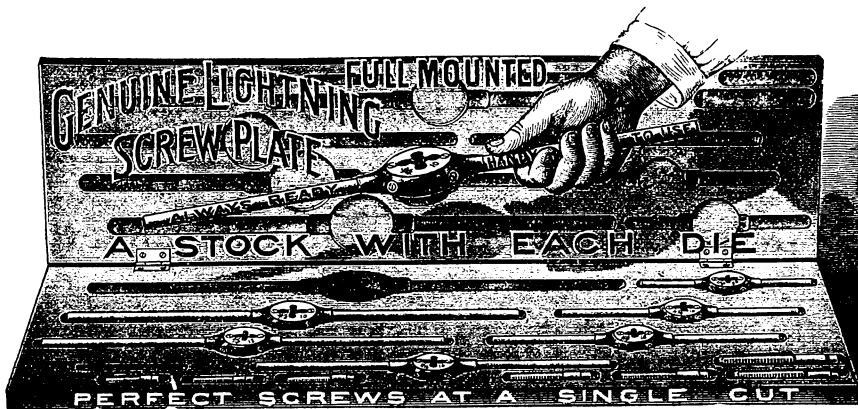
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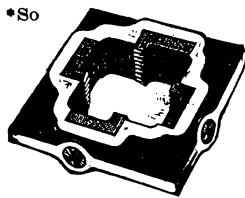
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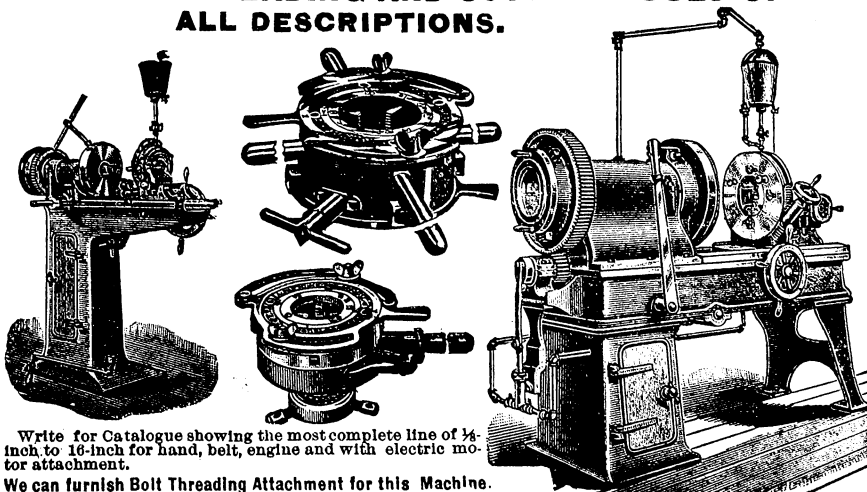
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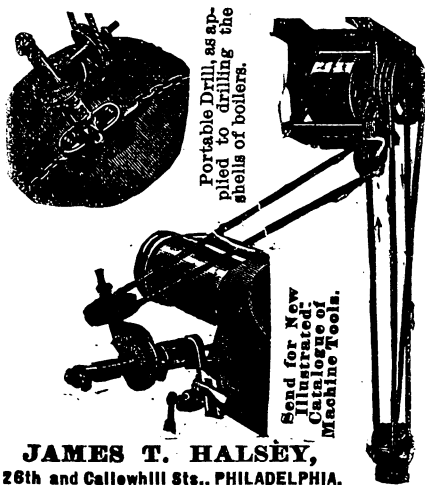
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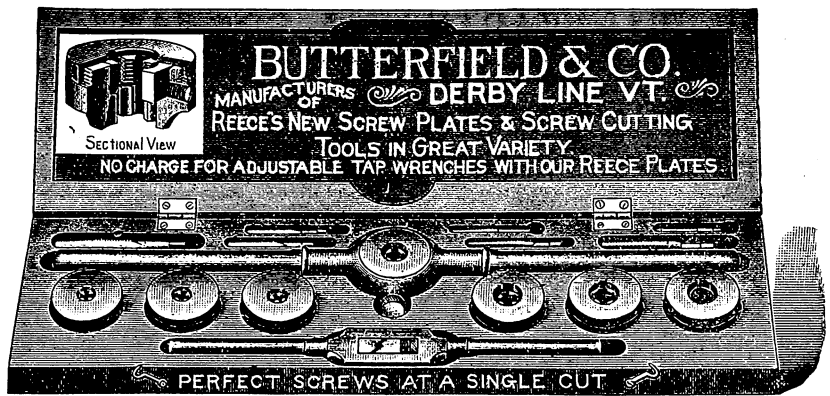
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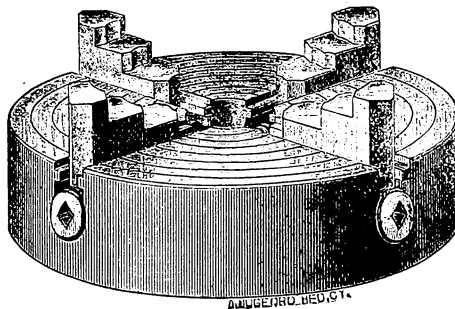
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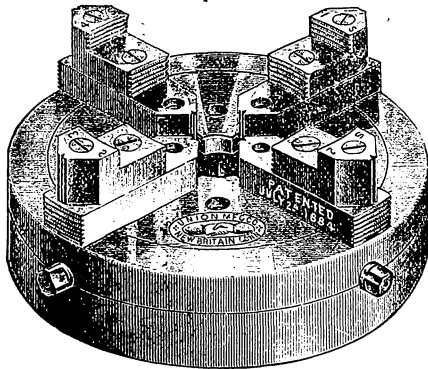
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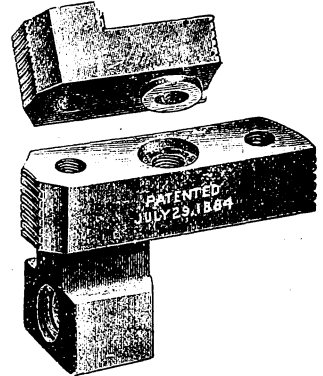
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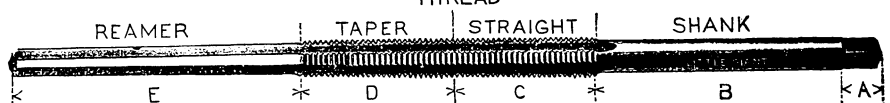
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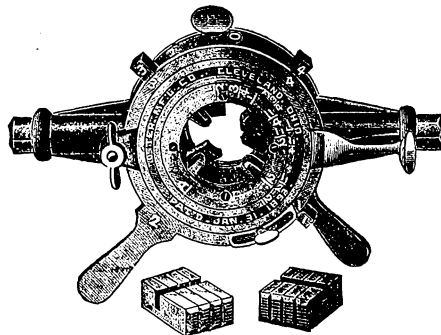
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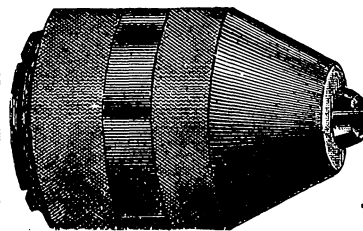
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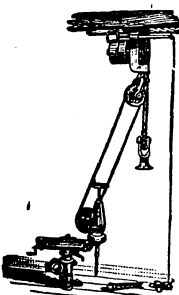
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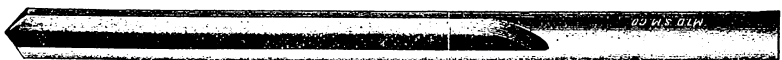
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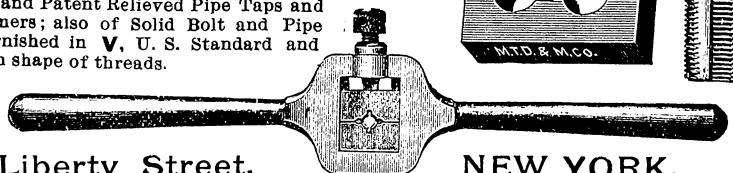
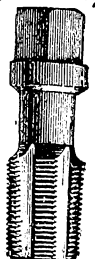
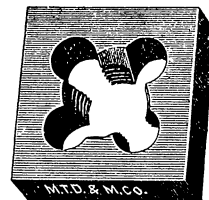
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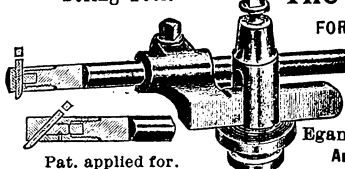
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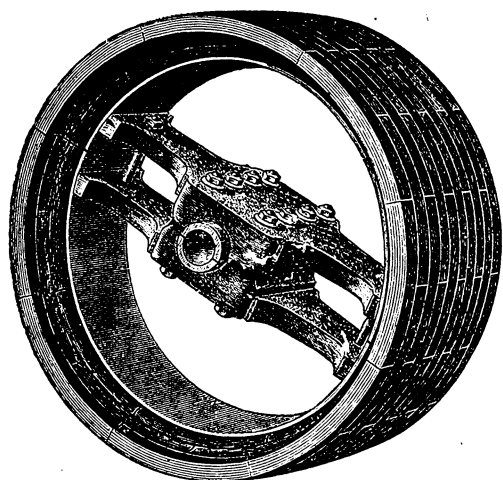
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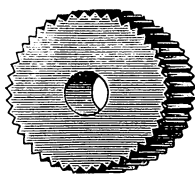
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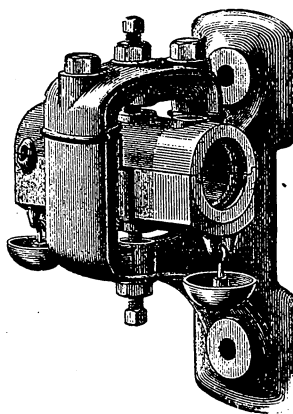
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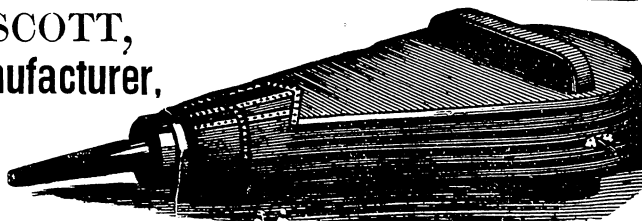


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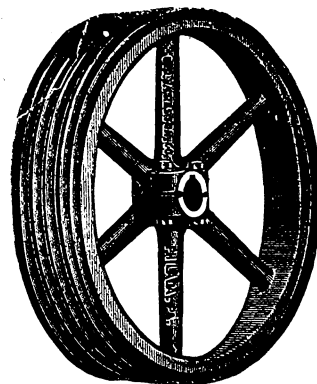
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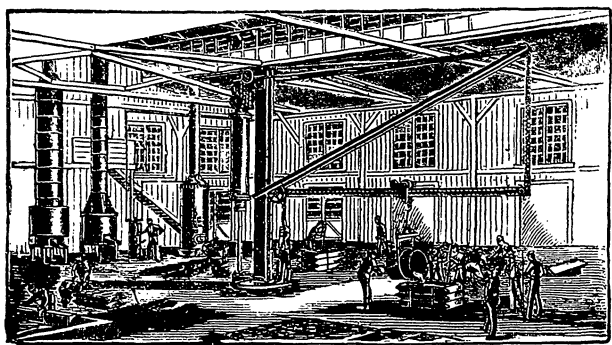
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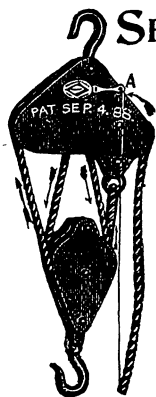
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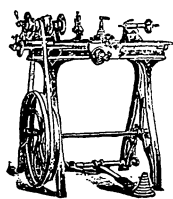
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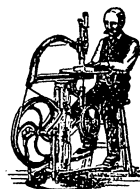
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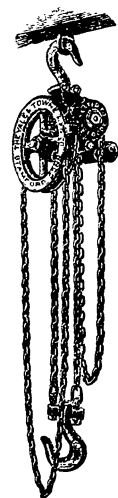
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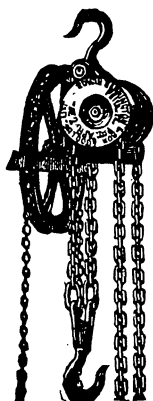
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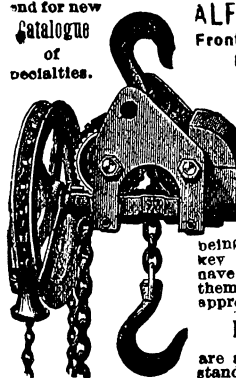


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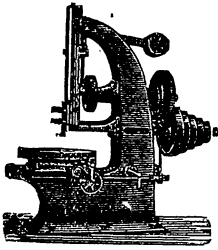
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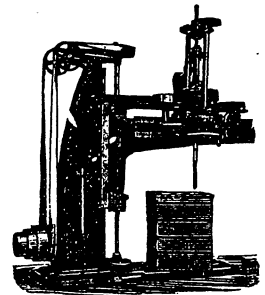
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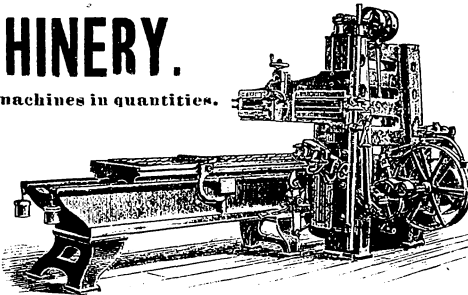
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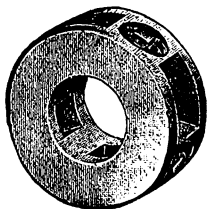
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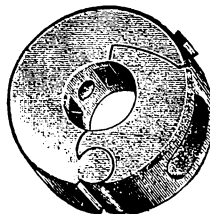


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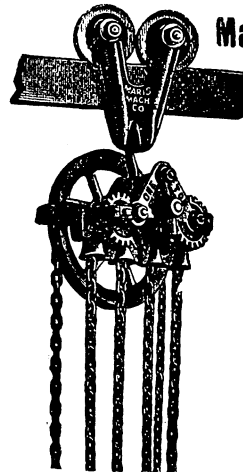
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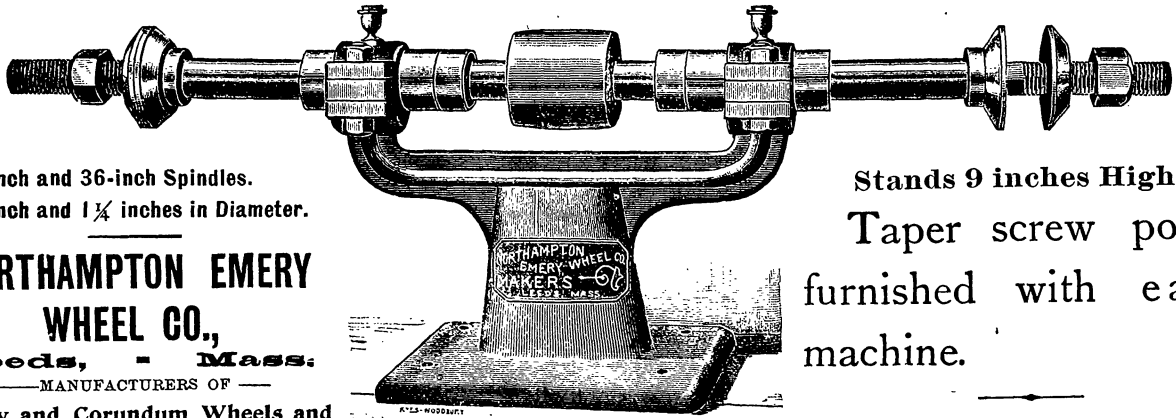
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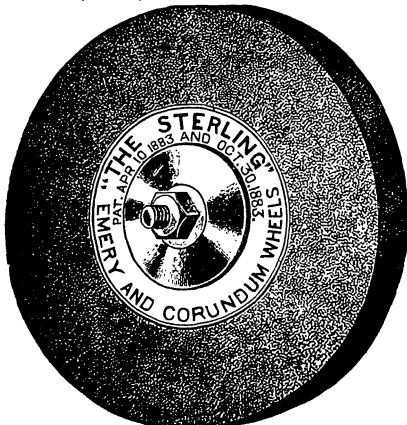
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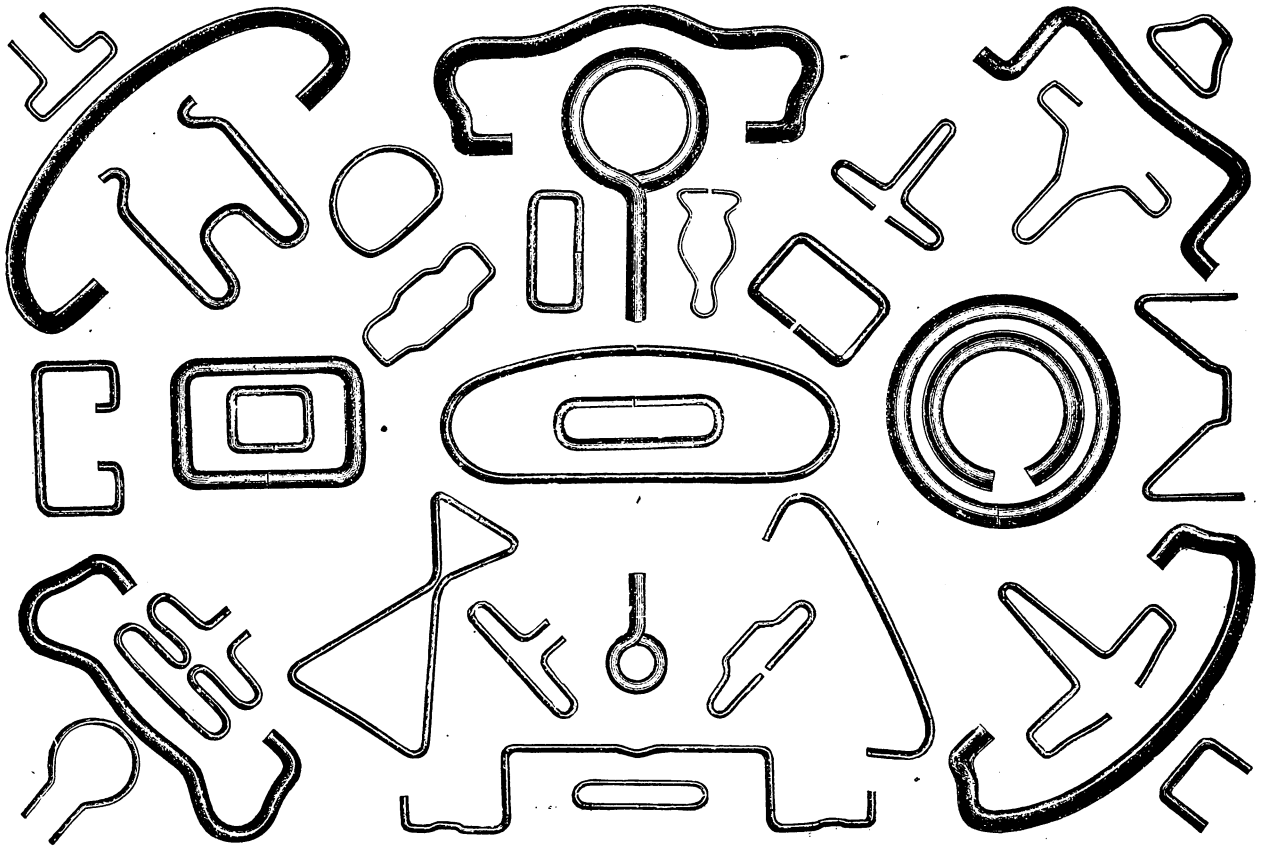
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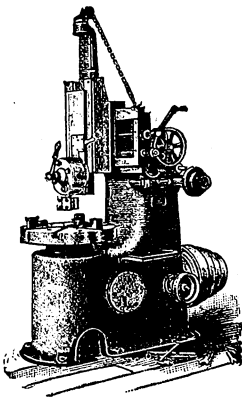
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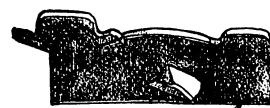
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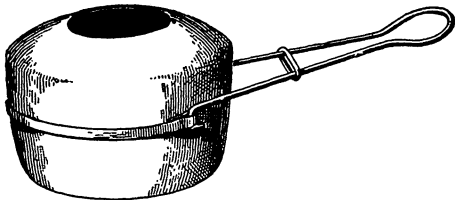


Fig. 108.—Clamp for Holding Tea Kettle while Being Tinned.

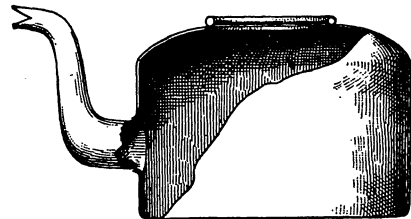


Fig. 110.—Tea-Kettle, Showing Spout Attached.

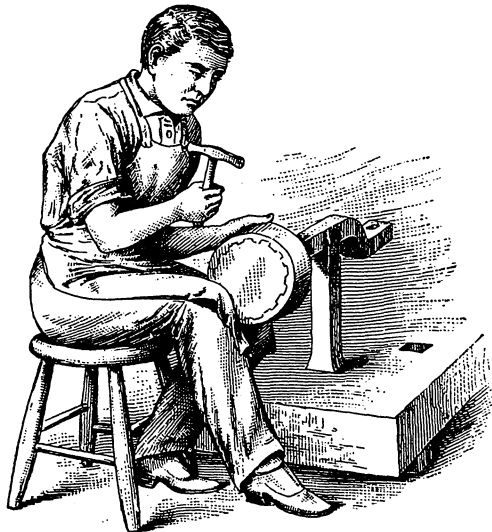


Fig. 107.—Planishing Tea-Kettle Side.

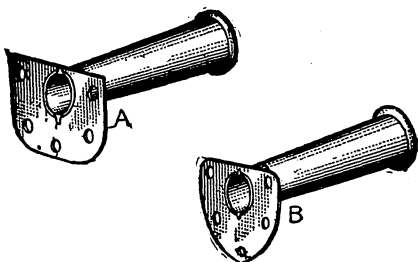


Fig. 54.—Way to Put the Flaps On.

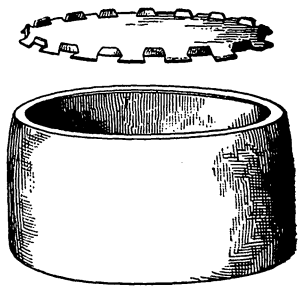


Fig. 105.—Putting in Bottom.

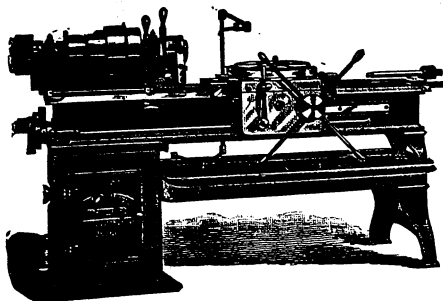
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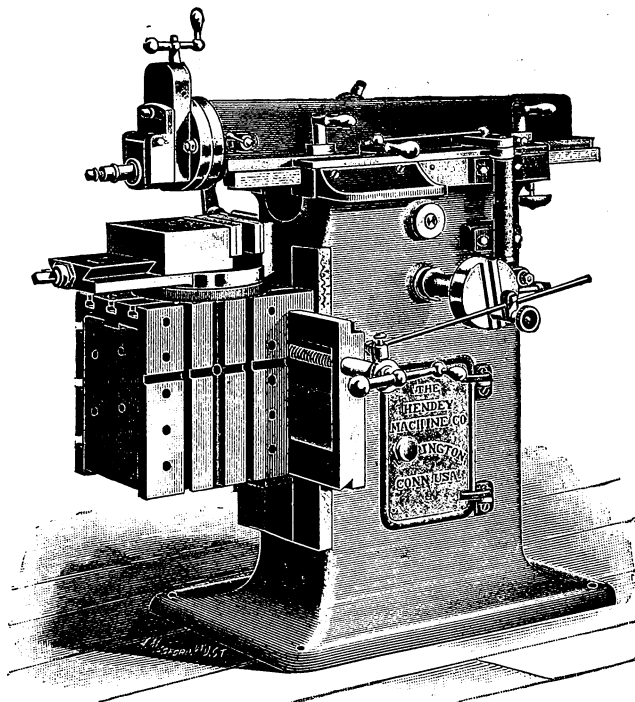
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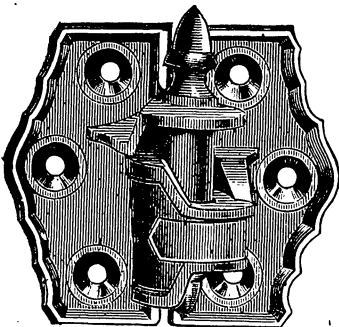


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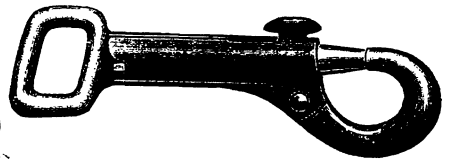
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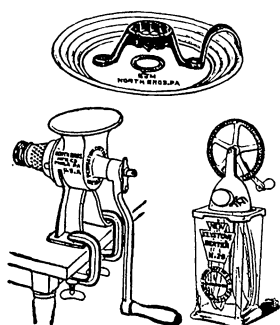
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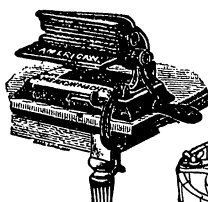
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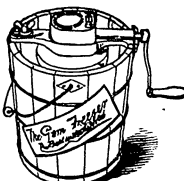


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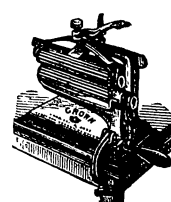
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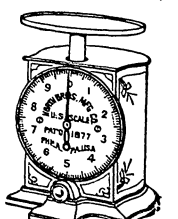


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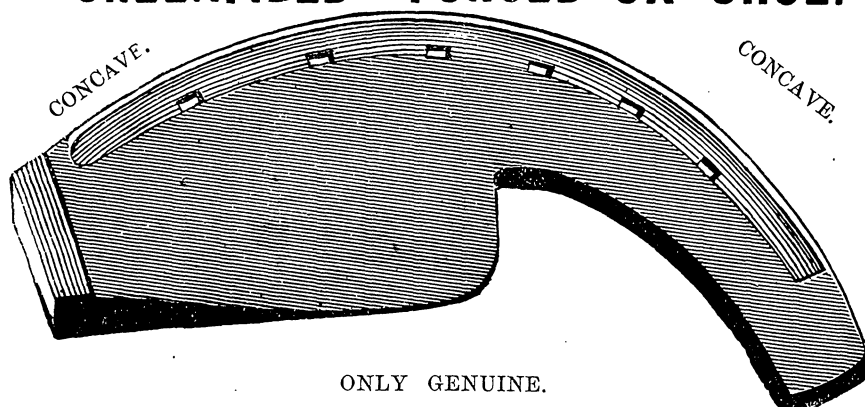
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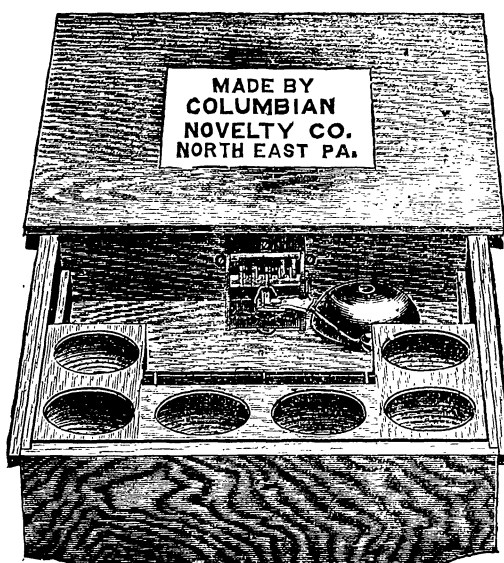
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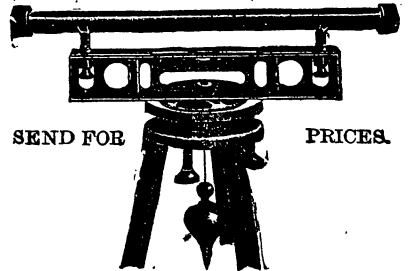
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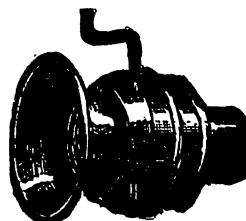
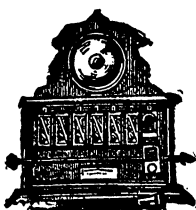
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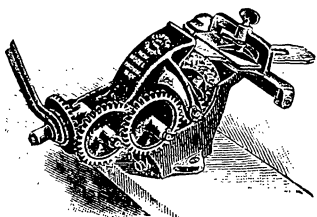
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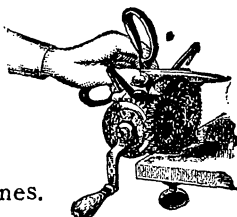
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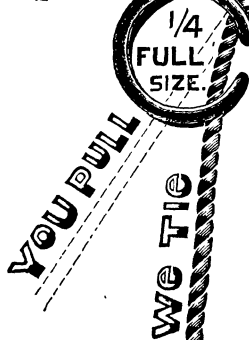
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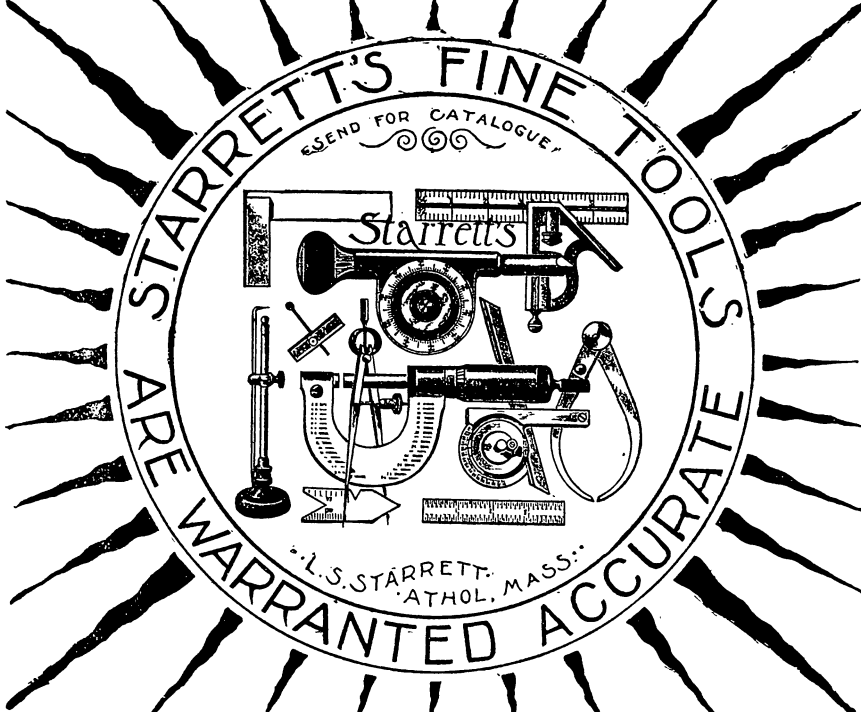
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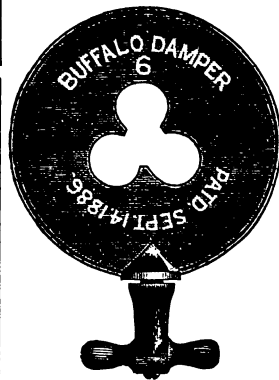
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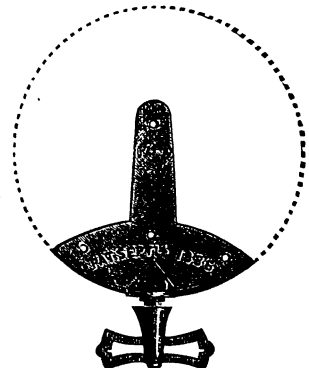
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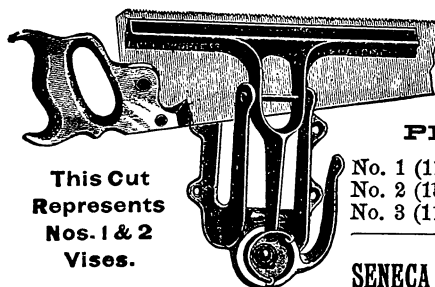
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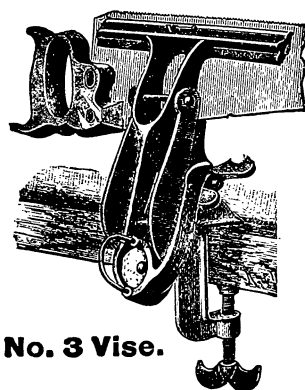
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LONGEST JAWS, HEAVIEST AND
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Sold by all leading jobbers of gen-
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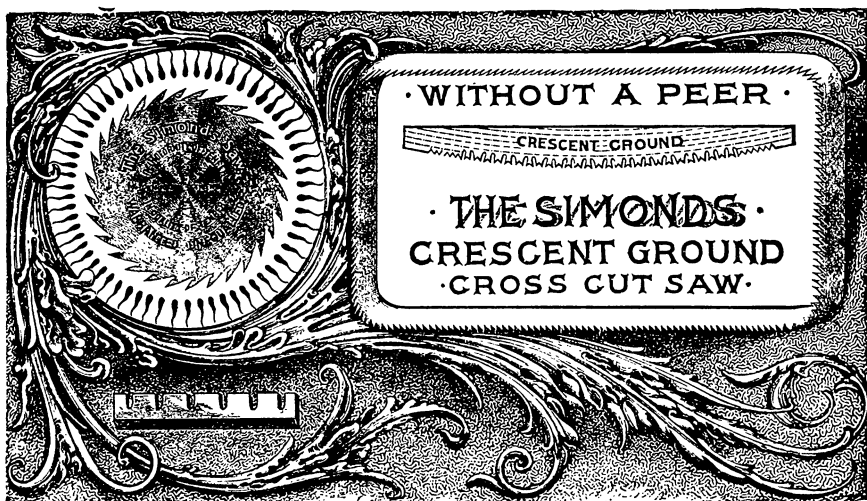
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The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

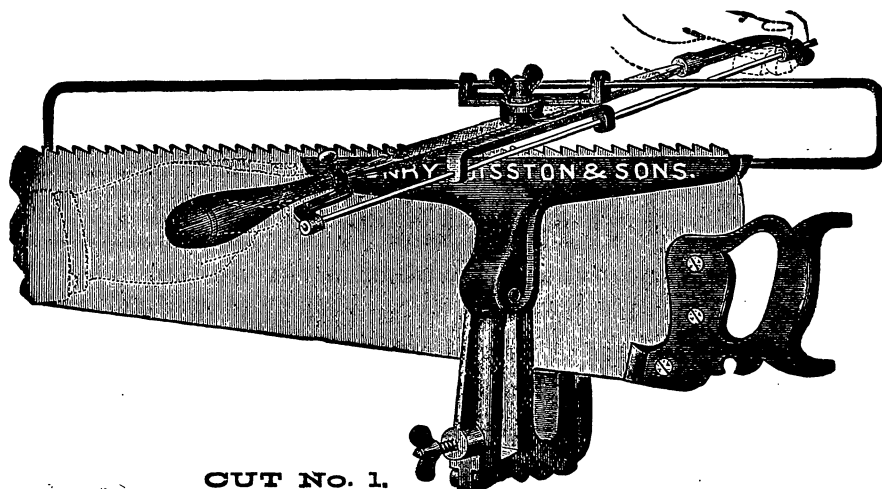
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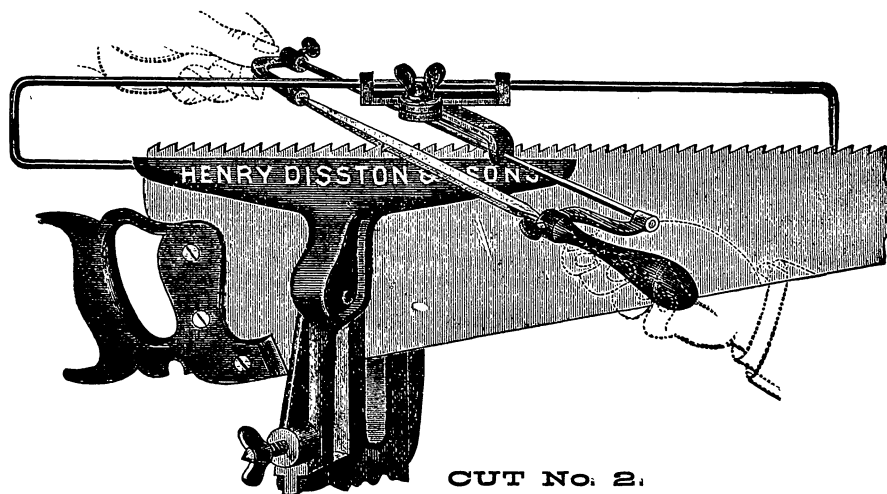
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ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT NO. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

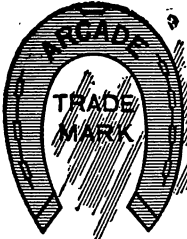
To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.


This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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LEAD PENCIL HOLDER 50¢
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NEEDLE POINT.
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HOW TO KEEP A STORE.

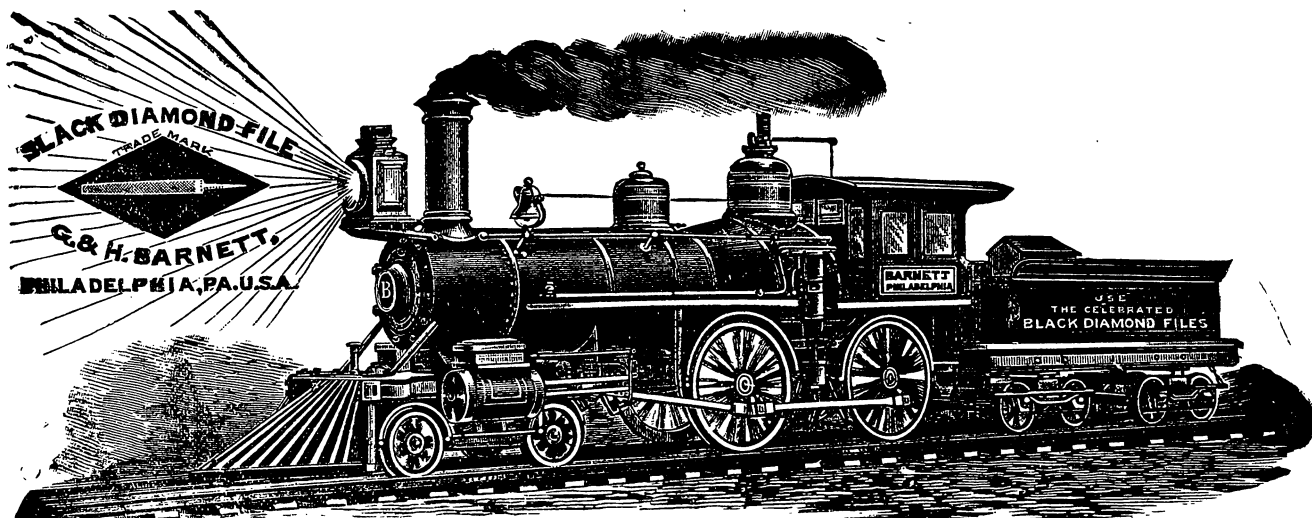
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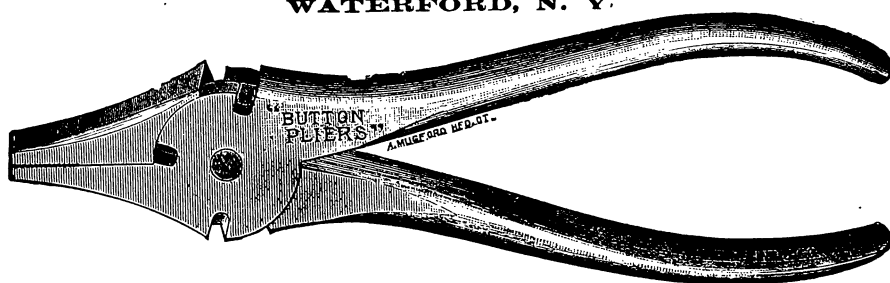
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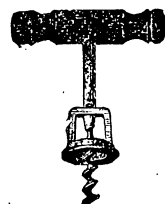
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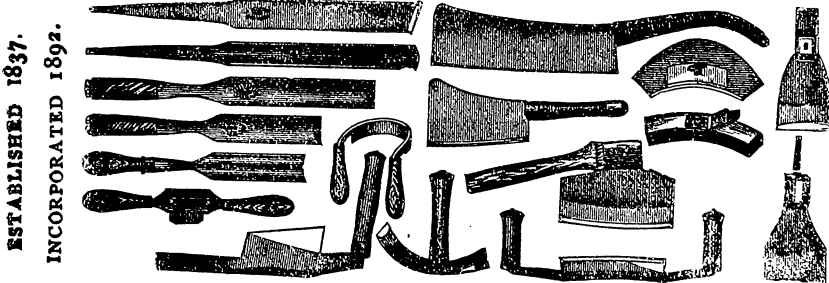


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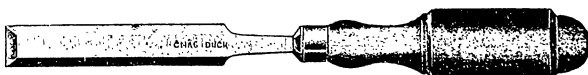
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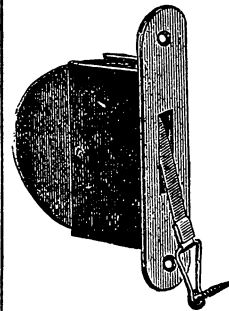
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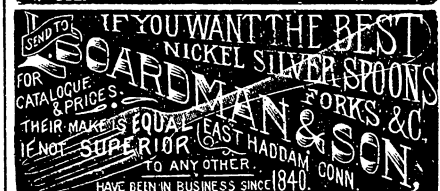


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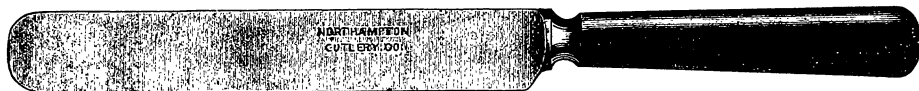
NEW YORK

122 Chambers

SALESROOM,

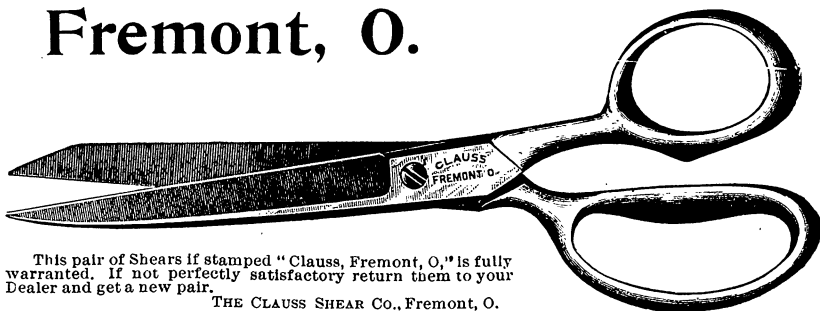
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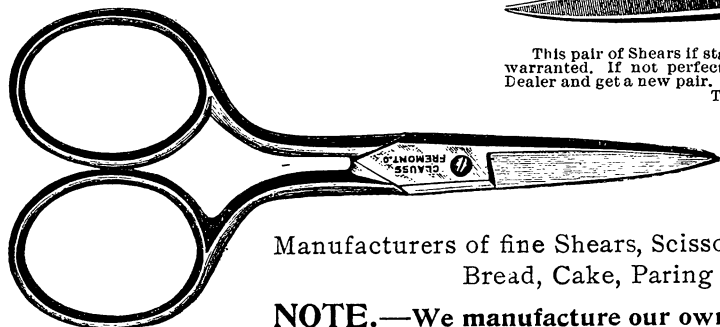
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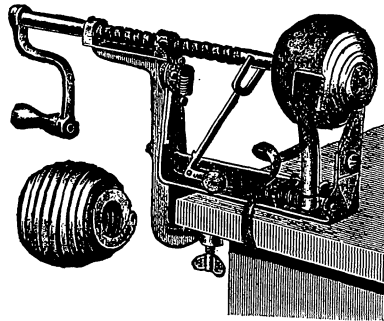
ORIGINATORS
OF STEEL
HOLLOW-WARE.

The Avery Stamping Co.,

CLEVELAND, O.

IF YOU WANT APPLE PARERS,

WE HAVE ALL KINDS, FROM SEVENTY-FIVE CENTS TO TWENTY DOLLARS EACH.



Our machines received highest award at the World's Fair. We are the oldest and largest manufacturers of Apple Parers in the world, and we make a larger variety than all others combined. If you are in need of Apple Parers write us. Our machines are sold by the jobbing trade everywhere.

GOODELL COMPANY, ANTRIM, N. H.

Are you in need of a good strapping?



If you are, give us a trial on our self drawing wire, that is put up in bundles of 100 pair each, in lengths of from four to twelve feet, or on reels of 5000 feet, and you will find it the most satisfactory **Box Strap** on the market.

**The DeHaven
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50-54 Columbia Heights,
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Pat. Dec. 13, 1887.



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20 PAGES, 5 x 7 1/4 Inches
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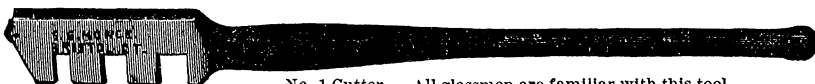
An address to the Institute of Accounts, New York, of which the writer is a member, put in form to assist those in charge of manufacturing accounts. Practical forms are included for a series of order books, examples of foreman's order, form of pay-roll, quarter-time book, job time book, form of summary, charges book, summary of costs, material, labor, cash, expense, manufacturing and improvement acts, store-room, iron foundry, brass foundry.

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No. 1 Cutter. All glassmen are familiar with this tool.

S. G. MONCE, BRISTOL, CONN.

NO MORE DULL RAZORS!

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Puts the keenest edge on the dullest razor. It has been thoroughly tested and its

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It is put up in an attractive manner and sells on sight. Send for samples and prices to the Sole Selling Agents,

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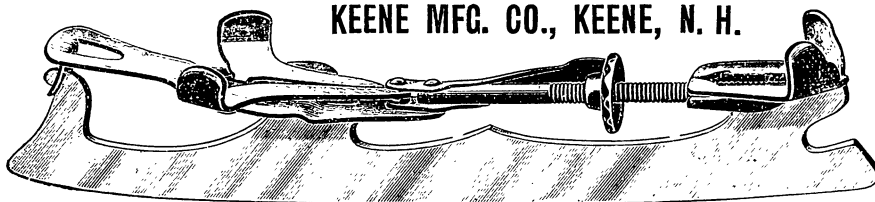


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The most extensive Skate Factory in the World.

LONG REACH ICE SKATES.

MANUFACTURED BY
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From the Cheapest to the Finest.

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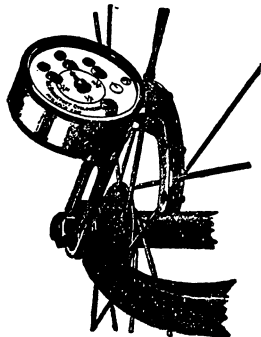
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Farwell, Ozmun, Kirk & Co., St. Paul, Minn.

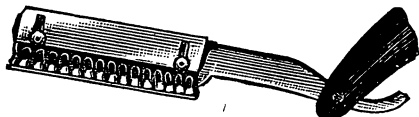
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Registers 1000 miles accurately and repeats, or can be set back to zero at any time. Perfectly Noiseless, Dust Proof and Water Proof. Nothing to get out of order and can be adjusted to any wheel. A high grade cyclometer within the reach of every bicyclist.

PRICE \$3.50
Made in two sizes, viz.: for 28-inch and 30-inch wheels, send for catalog of sundries. Sold by all bicycle dealers. Cyclometers will be ready for delivery April 1.

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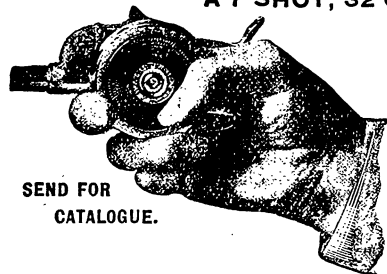


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A 7-SHOT, 32 CALIBRE, STANDARD CARTRIDGES.



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The most Genteel and Serviceable Rapid Firing Revolver ever manufactured. Carried in the vest pocket as easily as a watch. **Absolutely Safe! Automatic Safety Lock!** An Ideal Weapon for a man to carry. Selling by the Thousand. Elegantly Finished, Neatly Packed in a Box, Price \$6.00. Ask your Dealer for them or send to us.

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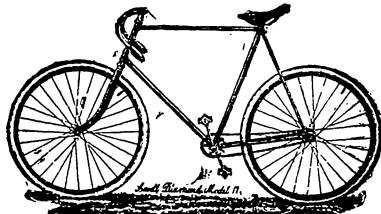
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We have closed out all our other styles and these are going. There is nothing like them at any price and no other price as low.

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CLEVELAND, OHIO.

LOVELL DIAMOND CYCLES.



HIGHEST GRADE.

All Sizes and Prices. See our line before you purchase.

All the Latest Improvements.

FULLY GUARANTEED.

JOHN P. LOVELL ARMS CO., M'f'rs,
BOSTON, - - MASS.

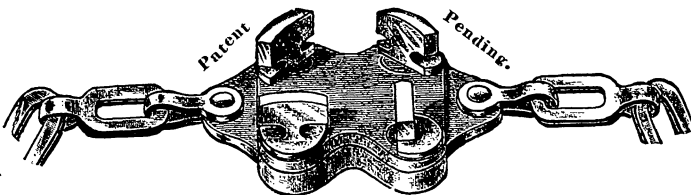
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THE GOODHUE COMBINATION LOCK.

A KEYLESS LOCK FOR CYCLISTS, TRAVELING MEN, ETC.
EASILY OPERATED IN THE DARK.

Strong.
Highly
Finished.



No
Two
Alike.

Special Design made for "Lockers."

List, \$1.00. Good Discount to Dealers. Manufactured and sold by
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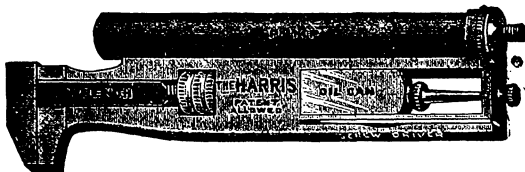
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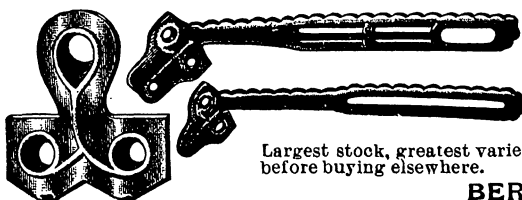


Wrench, Oil Can, Screw
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Made of drop forged steel, case
hardened; weight, 10 ounces or 3
ounces less than all the other tools
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Electrotypes on Application. Send for Descriptive Circular.

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Largest stock, greatest variety. Prices lower than ever. Write us
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In Your Business or at the Range?

If you deal in ARMS or AMMUNITION or shoot a
Rifle, Pistol or Shot Gun, you will make a HIT by
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are built to please the dealer and
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Are you in the bicycle business?
If not, you can make it pay to
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Every Year

the "STERLING" becomes more popu-
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No worry over repairs.

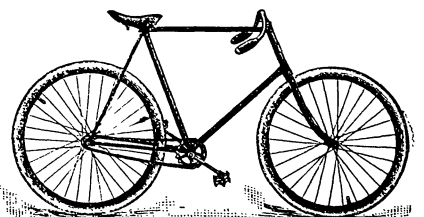
THE STERLING
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A wonderful, strong, light wheel, with
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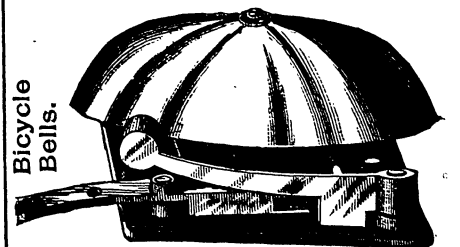
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THAT'S THE WHEEL!



Write for Catalogue and Agency.

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Manufacturers of
Sleigh Bells, House, Tea Hand, Gong Bells, &c.

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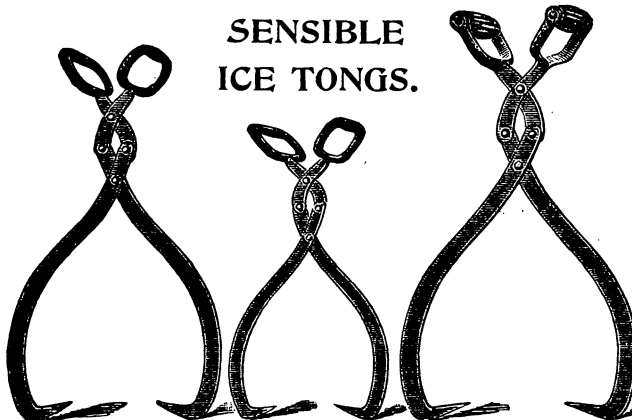
Manufacturers of **SAD IRONS AND HARDWARE.**

All of our Ice Tongs,
for loading or hand
use, are made of steel,
with tempered points,
causing them to be
very light and stiff.

The Shape, Finish and Quality
of all our goods is second
to none.

Factories,
Rochester, N. Y.
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SENSIBLE
ICE TONGS.



REGULAR SIZES, 12 IN., 16 IN., 20 IN., 24 IN., 28 IN.
Special sizes made to order.

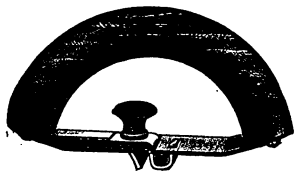
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Our Improved Duplex
Tongs

give the widest sweep
at the points, with but
comparatively small
action at the handles,
and the duplex action
gives greater force.

Write for our 1894 Catalogue
of Standard Goods and
Patented Specialties.

New York Office,
W. H. JACOBUS,
90 Chambers St.

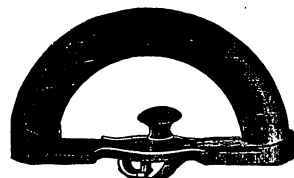


PATENT APPLIED FOR.
The Steel Stretcher Handle,
for Mrs. Potts' Sad Irons,
in Hazel Wood only.
No. 110.

The Cleveland Wood Turning Co.,
710-726 Scranton Ave., Cleveland, O.

Special work in Handles and Wood Turning of all
kinds. Our line of regular made Tool Handles is the
best.

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Walnut, Japanned, No. 1.
Walnut, Tinned, No. 2.
Hazel, Japanned, No. 10.
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THE BOLGIANO MANUFACTURING CO., BALTIMORE, MD.,

MANUFACTURERS OF { Water Motors, Self-heating Sad Irons and Soldering Irons, Combination
Electric Fan Water Motors, Ventilating Fans and Ventilated Bread Boxes.

Send for Illustrated Catalogue with Wholesale Price List.

Patented April 25, 1893.



NEW WATER MOTOR, \$5
BOLGIANO'S LITTLE GIANT, No. 1,
Will run your Sewing Machine, Fans and other Light Machinery.

A Week's Work
Done in a Day.
No Plumbing
Required.

SOMERVILLE, MASS., Nov. 21, 1893.
THE BOLGIANO MFG. CO., Baltimore, Md.
Gentlemen:—Your No. 1 Motor just received. I am
more than pleased with it. It will do all you claim for
it. I have tried it with several different kinds of light
machine work. I shall always have the best word to
say for this little wonder. Yours truly,
CHAS. E. PARKHURST, 79 Walnut St.

NOBLESVILLE, IND., Jan. 29, 1894.
THE BOLGIANO MFG. CO., Baltimore, Md.
Gentlemen:—The "Little Giant" Water Motor
came to hand in due time, and works the sewing
machine like a charm. Yours very truly,
NOBLESVILLE MILLING CO.

No. 2, \$10. Fans, Ice Cream Freez-
ers, Lathes, Scroll Saws,
Church Organs, etc.

COLORADO SPRINGS, COLORADO.

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Gentlemen:—We received the "Little Giant" Motor No. 2 on April 28, and have tested it in every possible
way, and find that it works perfectly. At present it is running an eight and twelve old style Gordon press,
and takes it at a very fast rate. We are more than pleased with it, and we will recommend it to everybody
as a safe investment for their money. Yours respectfully, WOODS BROS.
NO 3. MOTOR, \$15. For Fans, Printing Presses, Grindstones, All Sizes of Light Fans for sale.
Coffee Mills, Washing Machines. Send for Circulars.

BOLGIANO'S

New Hot Air Soldering Gas Iron.

NICKEL
PLATED.



(Patent applied for.)

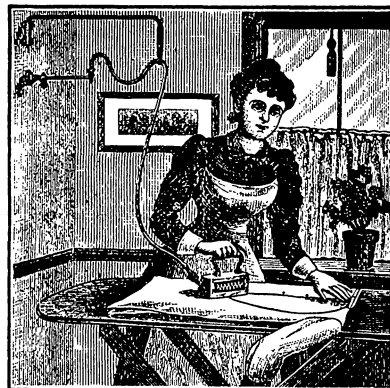
COSTS 5 CENTS A
DAY TO HEAT.

USES THE AIR AS FUEL WITH A PINHOLE OF GAS.

The most economical and labor saving Soldering Iron in the world.

No stove is required. The room keeps cool and pleasant.

PRICE \$3.00.



BOLGIANO'S PERFECTION GAS IRON.
Patent applied for, 1894.

**NEW HOT AIR \$3
GAS IRON, 3**

Bolgio's Perfection Gas Iron enables you
to do your ironing without the use of a stove,
and is in every way superior to anything of
the kind ever offered the public. Gets hot
in 5 minutes and costs 5 cents a day to heat.

CHARLESTON, W. VA.
BOLGIANO MFG. CO., Baltimore, Md.
Gentlemen:—We enclose you our check for Iron,
which we have used with excellent satisfaction.

Very truly yours,
GEO. B. MAIR.

A WORD TO ENTERPRISING HARDWARE DEALERS

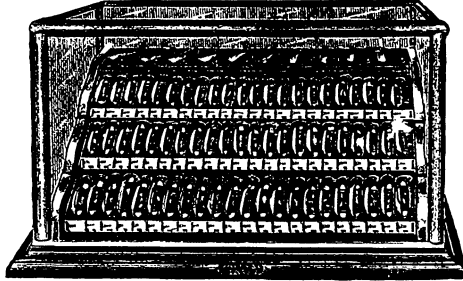
Of the United States and the World at Large.

For several weeks past we have sought an introduction to you by showing you each week cuts and description of the

"Dempsey" Patent Cutlery Display Case.

We can utter no commendation for these cases which could be overdrawn, they are exactly what every enterprising hardware man needs; what he wants; what he can ill afford to do without; what he must have to make his cutlery trade the easiest handled and produce the most satisfactory results. We have at great expense perfected arrangements by which we can ship 20,000 per annum. We have established throughout the world. Many of our and knowing full well that when they freely they assist themselves, our except freight, one of these cases properly in respectable quantities. Ask the for particulars. Remember that our of pocket knives with two dozen patterns lar case. Look out for a big fall trade, shining shekles by displaying your money making device ever offered the

PATENTED OCTOBER 3d, 1893.



For further information, descriptive circulars, &c, apply to your jobber, or write us direct.

Yours for a big trade,

THE UNION SHOW CASE COMPANY, CHICAGO, ILLINOIS, U. S. A.

The Following Leading Firms are our Duly Authorized Agents:

Dame, Stoddard, Kendall & Co., Boston, Mass.
F. A. Koch & Co., New York, N. Y.
Electric Cutlery Co., New York, N. Y.
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Henry Keldell & Co., Baltimore, Md.
The Wm. Bingham Co., Cleveland, Ohio.
Speer Hardware Co., Fort Smith, Ark.
Dixon, Bergeson & Co., Portland, Oregon.
Horton, Gilmore, McWilliams & Co., Chicago.

Baker & Hamilton Hardware Co., San Francisco, Cal.
Kirkpatrick Hardware Co., Atlanta, Ga.
W. C. Belknap & Co., Louisville, Ky.
A. F. Shapleigh Hdw. Co., St. Louis, Mo.
The Wyeth Hardware & Mfg. Co., St. Joseph, Mo.
Rogers & Baldwin Hdw. Co., Springfield, Mo.
McGregor-Noe Hdw. Co., Springfield, Mo.
Webb & Nelegar Co., Chicago, Ill.
Wadsworth & Matheson, Jacksonville, Ill.

Henry Sears & Co., Chicago, Ill.
John Pritzlaff Hdw. Co., Milwaukee, Wis.
Farwell, Ozmun, Kirk & Co., St. Paul, Minn.
Fletcher Hardware Co., Detroit, Mich.
Van Camp Hardware & Iron Co., Indianapolis, Ind.
The Way Hardware Co., Hartford, Conn.
Alfred Ely & Co., Baltimore, Md.
E. F. W. Meier, St. Louis, Mo.

FOURTH REVISED EDITION.

THE IRON AGE STANDARD HARDWARE LISTS

FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans and Round Boilers.

	Plain	Turnd.	Tin'd or En'd.
Pints.			
1	\$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by ¼ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Wrenches. Standard List.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Stove Hollow Ware.

	No.	6	7	8	9	10	11
POTS, KETTLES, ETC. (CAST IRON.)							
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75	
Kettles.....	.55	.65	.70	.85	1.00	1.40	
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60	
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

	No.	1	2	3	4	5	6
Scotch Bowls.	\$0.35	.40	.45	.50	.60	.70	
Yankee Bowls.	.35	.45	.55	.65	.75	.90	

Glue Pots.

	No.	4/0	5/0	6/0	7/0	8/0	9/0	10/0	11/0	12/0	13/0	14/0	15/0	16/0	17/0	18/0	19/0	20/0
Glue Pots.																		
	4/0	5/0	6/0	7/0	8/0	9/0	10/0	11/0	12/0	13/0	14/0	15/0	16/0	17/0	18/0	19/0	20/0	
	4.50	5.00	5.50	6.00	6.75	7.50	8.25	9.00	9.75	10.50	11.25	12.00	12.75	13.50	14.25	15.00	15.75	16.50

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

That the Standard Hardware Price Lists meet a want of the trade is evident from the fact that a Third edition is already called for.

EVERY HARDWAREMAN SHOULD HAVE A COPY. Price 25 cts.

Sent, postpaid, on receipt of price, by DAVID WILLIAMS, Publisher, 96-102 Reade Street, New York.

RUDGE BICYCLES.

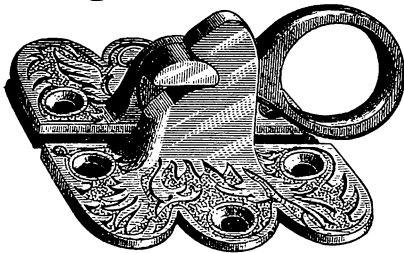
Responsible Agents wanted everywhere.

THE BRONSON SUPPLY CO., New York and Cleveland.

"CONROY"

Refrigerator Door Fasteners

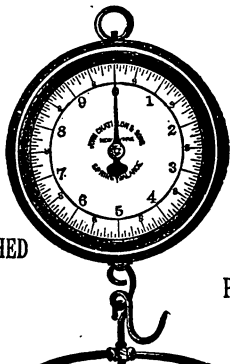
Have rapidly supplanted all others.
Refrigerator Trimmings.



P. J. CONROY & CO., Paschall, PHILADELPHIA.

John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.

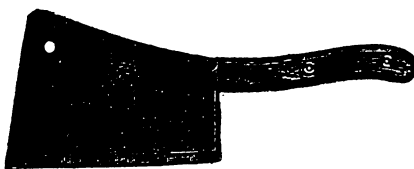


ESTABLISHED
1835.

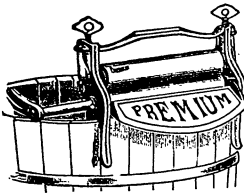
SEND FOR
PRICE-LIST.



Sole Agents for
Foster Bros.' Butchers' Cutlery.



John Chatillon & Sons, N. Y.



COLBY WRINGER CO., - Montpelier, Vt.

MANUFACTURERS OF THE

Premium Wringer,

With Automatic Apron Adjustment.

SURPLESS, DUNN & ALDER, Direct Representatives,
15 Murray Street, New York.



No. 3

Globe Street Lamp.

Light your Streets and Driveways.

The S. G. & L. CO.

Tubular Globe Street Lamp

IS THE Best Street Lamp Manufactured.

Equal to the best Gas Light.

Will not Blow Out in the Strongest Wind.

Will not Smoke.

Will not Freeze.

Automatic Extinguisher.

Outside Wick Regulator.

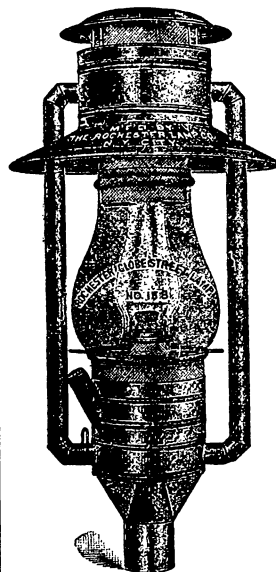
Will Burn Four Hours for One Cent.

MANUFACTURED BY

STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.



The Rochester Globe Tubular - - Station and Street Lamp.

It's a long name, but it tells a good deal. It tells you of a new Street Lamp with "The Rochester" Central Draft Burner. A central draft burner (round flame) gives three times the light of an old style flat-wick burner. The first and only Tubular Globe Central Draft Lamp ever made! Storms, rain, snow, sleet or hail do not affect it. Burns all night. Made with either bail or post socket, with 26 inch enamel reflector if wanted, for railroad and other uses. Takes regular No. 3 or 9 street lamp globe, to be had everywhere. For Railroad Stations, Ware-rooms, Mills, Docks, &c., it is the best lamp ever made. Price, \$6.00; send for trade discount.

MANUFACTURED ONLY BY

THE ROCHESTER LAMP CO.,

42 PARK PLACE, }
37 BARCLAY ST., } NEW YORK.

This is the "SALEM" HANGER.

And when it is on the window casing, a TEN-ANT can put up ANY SHADE FIXTURE that is made without using a screw. THE MAN INTERESTED is the owner of the house THE MAN to sell the "Salem" to the owner IS THE HARDWAREMAN.



Write us for Price-List.

The W. A. South Co., Salem, Mass.

Our Goods are
Sold by the
TRADE.

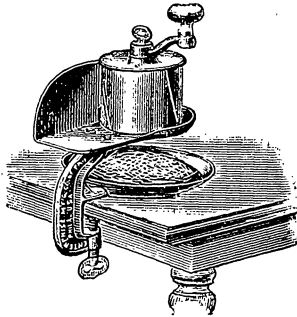
The Enterprise Manuf'g Co., of Penna.,
3d and Dauphin Sts.,
PHILA., PA.

We Make
First Class Goods
Only.

Slaw Cutter No. 94.

For Slicing
Cabbage,
Potatoes,
Onions,
Cucumbers,
Citron, Etc.

HAS NO
EQUAL AS
A SLAW
CUTTER.

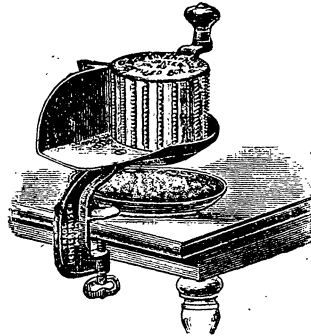


PRICE, \$3.00.

We are constantly adding new articles to our line and no live hardware dealer should fail to send for one of our latest illustrated catalogues.

Grater No. 93.

For Grating
Horse Radish,
Cocoanuts,
Crackers
For
Fried
Oysters, Etc.



PRICE, \$3.00.

New York Branch, J. C. McCARTY & CO., 97 Chambers Street.

Low Prices and High Quality.

Our styles of Corn Poppers are guaranteed to be all of the latest and best.

Write to know what our quantity discounts are.

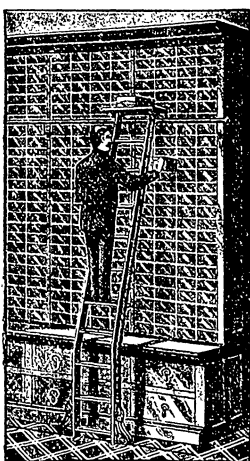


Dealers everywhere are entitled to New Catalogue and New Prices.

Bromwell Brush & Wire Goods Co., - - Cincinnati, O.
ESTABLISHED 76 YEARS.

THE Bicycle Step Ladder.

Especially adapted for
Hardware Stores.



THE - - -
NEWEST,
NEATEST,
SIMPLEST,
EASIEST OPERATED,
and SAFEST



----- STORE LADDER MADE.

Highest Award World's Fair.

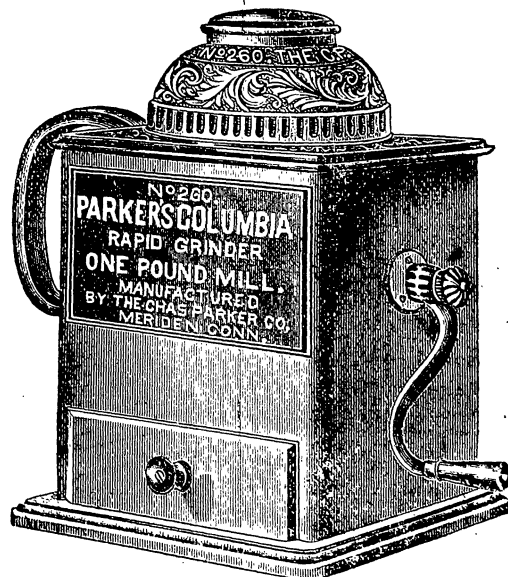
WRITE US.

The Bicycle Step Ladder Co.,

N. Y. AGENCY:
E. J. HUSSEY & CO.,
80 John St.

50 State St.,
Chicago, Ill.

THE CHAS. PARKER CO. MERIDEN
MANUFACTURERS OF
THE PARKER GUN VISES THE PARKER LAMP
WOOD SCREWS COFFEE MILLS,
CABINET-LOCKS SPOONS &c.



This illustration represents our Columbia One-Pound Mill No. 260.
The Handsomest and Best Mill of this Character in the Market.
We have over sixty other styles and sizes. Catalogues furnished dealers.

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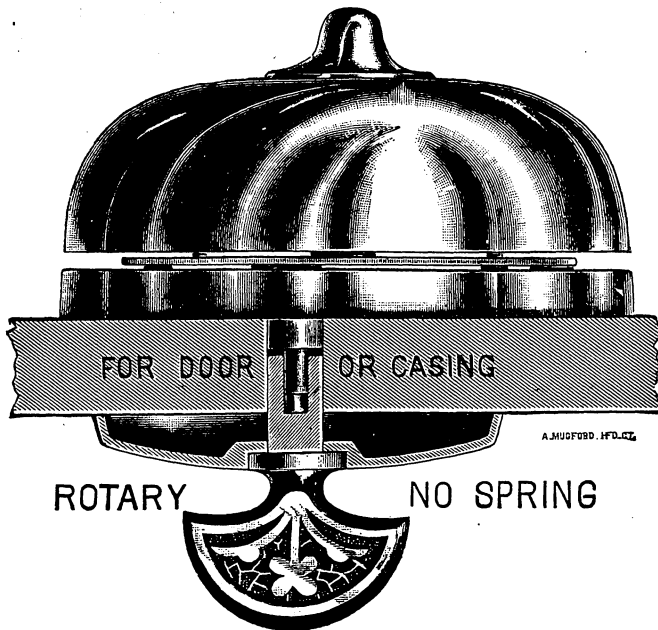
ELECTRICAL RESULTS.

3 Inch.

No. 91, Nickel Plated.

No. 92, Bronze Plated.

Per Doz., \$17.50.



3 1/2 Inch.

No. 101, Nickel Plated.

No. 102, Bronze Plated.

Per Doz., \$20.00.

Simply turning the knob about **one-fourth** in either direction produces about **ten clear, full tones**, which though not startling or annoying, can be better heard all through the house than any bell ever made to imitate Electrical Results.

SOLE AGENTS,

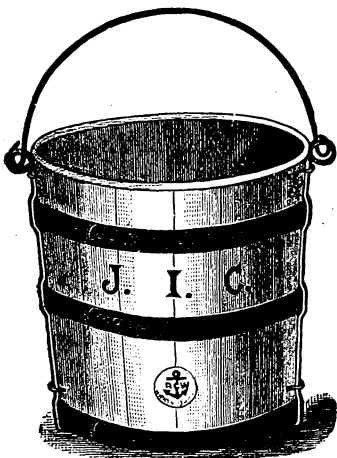
JOHN H. GRAHAM & CO.,

113 Chambers St.,

N. Y. CITY, N. Y.

WRITE FOR PRICES.

"J. I. C." HORSE PAIL



Patented August 26, 1886.

Made of Best Seasoned White Oak or Virginia White Cedar.

SEE THAT STRAP?

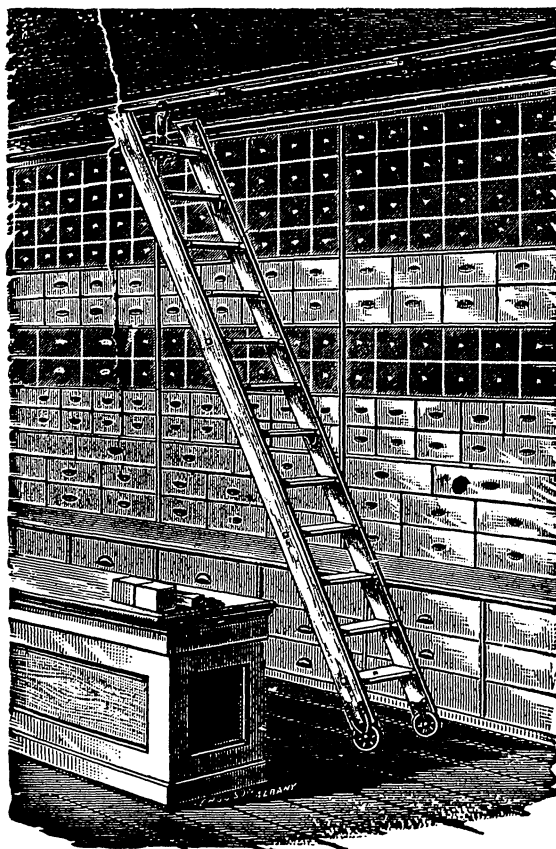
Hoops cannot come off. Best stable, mortar and building pail ever made.

Prices quoted on applica'tion.

RICHMOND CEDAR WORKS,

Manufacturers of Woodenware,
RICHMOND, VA.

THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

M. CROISSANT,

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IMPROVED EDITION OF THE IRON AGE HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

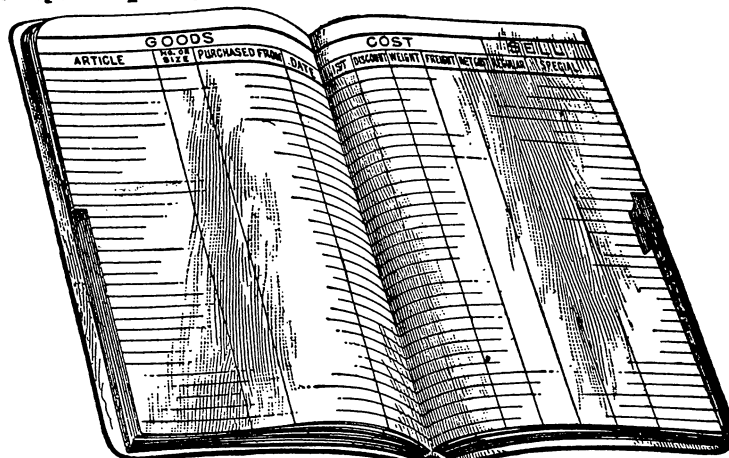
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

A, 200 pages, - - - - -	\$1.00
A F, 200 pages with flap, - - - - -	1.25
A 2, 400 pages, - - - - -	1.50
A F 2, 400 pages with flap, - - - - -	1.75



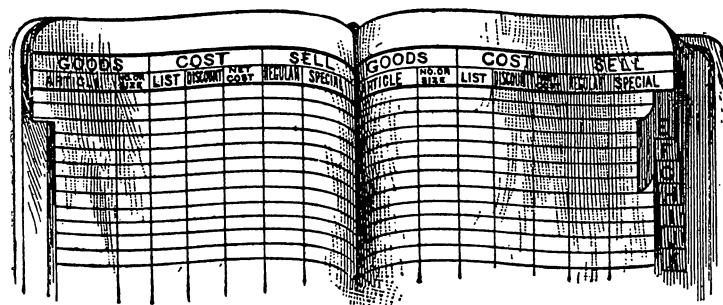
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

B, 200 pages - - - - -	\$1.00
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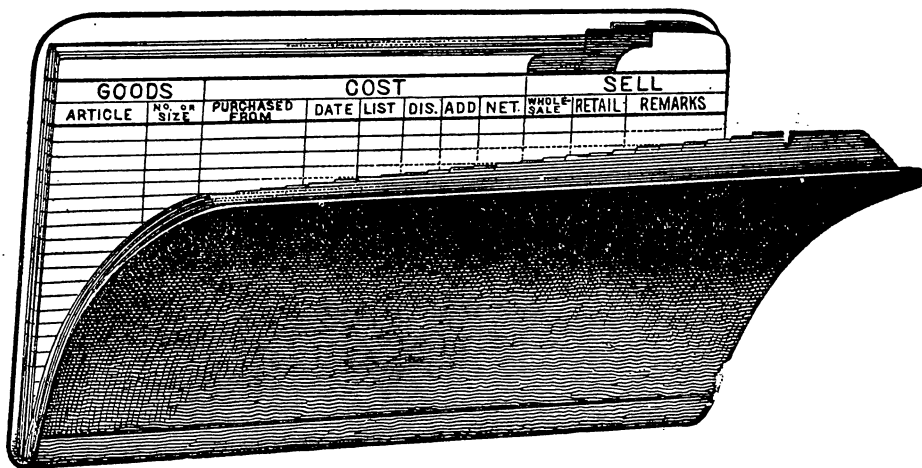
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

Size, 4 1/4 x 7 1/4 in.; grain seal leather.

FOUR EDITIONS.

C, 200 pages, - - - - -	\$1.00
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C 2, 400 pages, - - - - -	1.50
C F 2, 400 pages with flap, - - - - -	1.75



Hardware Price Book C.

Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

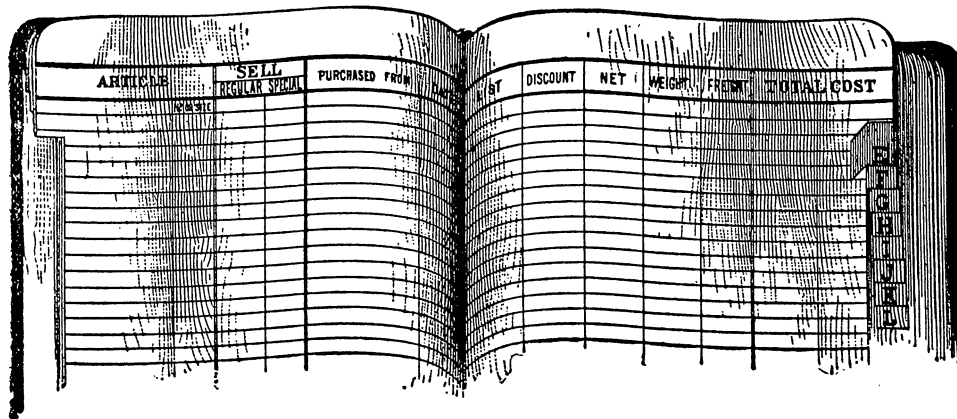
The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This arrangement is adapted to the requirements of the trade in this direction.

Size 5 1/4 x 8 in.; grain seal leather.

FOUR EDITIONS.	D, 200 pages, - - - - -	\$2.00
	D F, 200 pages, with flap, - - - - -	2.50

D 2, 400 pages, - - - - -	\$3.00
D F 2, 400 pages, with flap, - - - - -	3.50

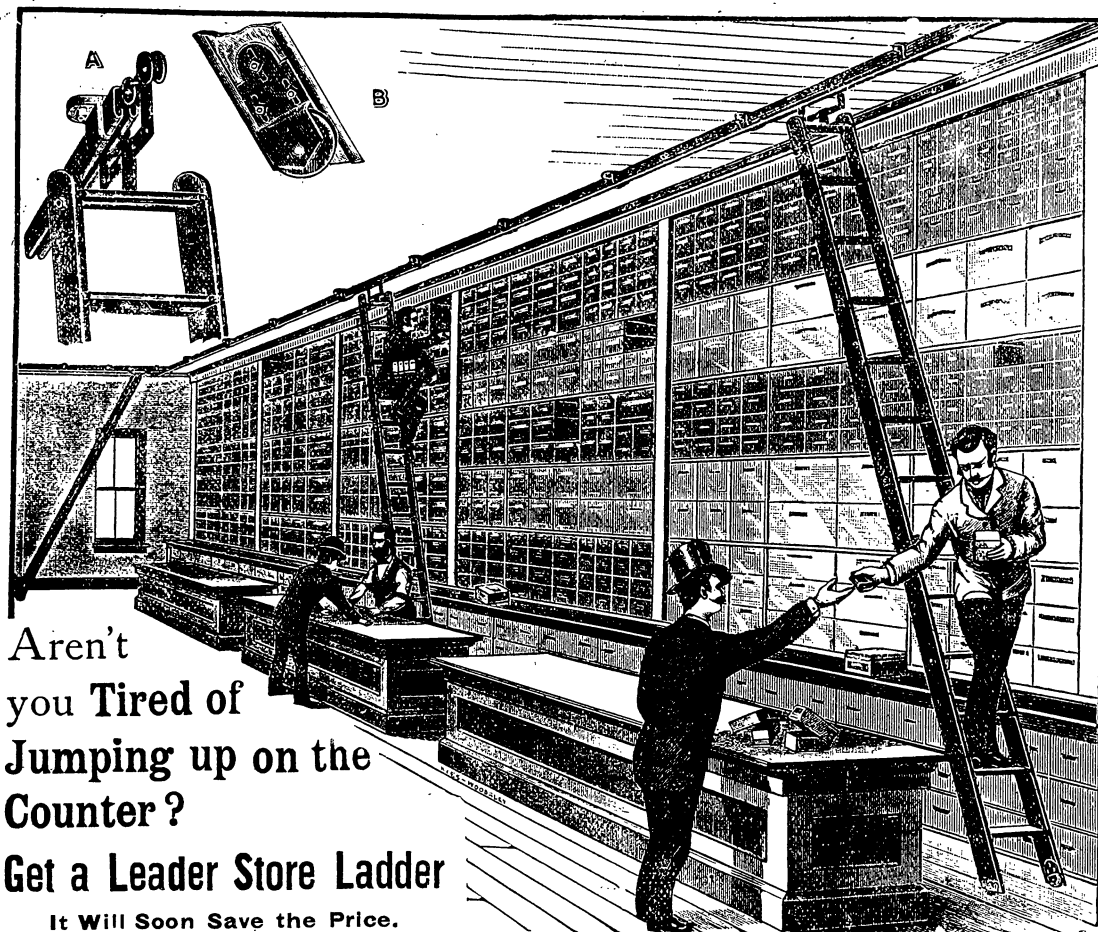
Sent, post-paid, on receipt of price by **DAVID WILLIAMS, Publisher, 96-102 Reade St., New York**



Hardware Price Book D.

THE TROLLEY LEADER STORE LADDER.

See Our Advertisement Next Week.



Parlor, Barn and Fire Door Hangers.

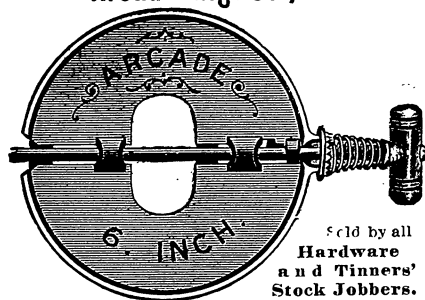
Aren't
you Tired of
Jumping up on the
Counter?

Get a Leader Store Ladder

It Will Soon Save the Price.

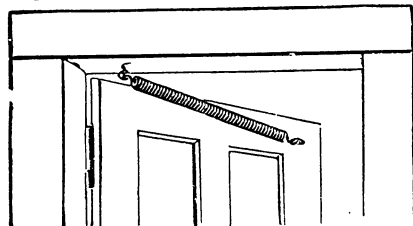
THE COBURN TROLLEY TRACK MFG. CO., - HOLYOKE, MASS.

Made by Arcade Mfg. Co., Freeport, Ill.



Sold by all
Hardware
and Tinnery
Stock Jobbers.

THE PERFECT DOOR SPRING.

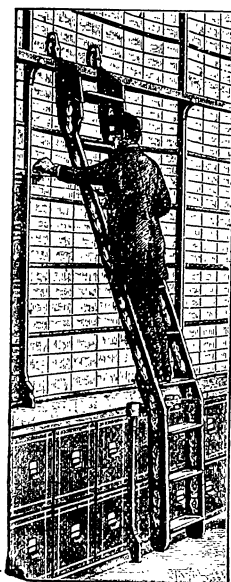


Cheap, Simple, Durable, Effective.
Best Screen Door Spring made. Send for our list of references, comprising some of the first houses in the land. They sell readily, and that is what you are looking for. Drop us a postal.

COILED WIRE BELTING CO.,
40 & 42 Noble St., Jersey City.

An Investment

That soon pays for itself, and a fixture you will wonder how you have got along without. Hundreds of recommendations to this effect. This is without doubt the best device of the kind on the market to-day. Steel rail planed to get the smoothest surface. Brackets made to fasten to standards, pilasters, or shelving direct. Can be adjusted to shelving with wide or narrow ledge, and can also be fitted where there is no ledge and can be used on circular rail as well.



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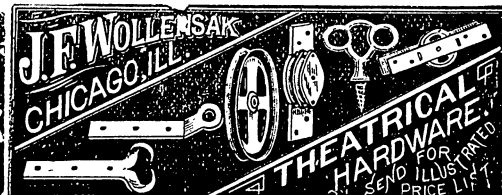
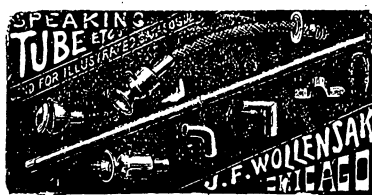
A postal card will get our Catalogue.

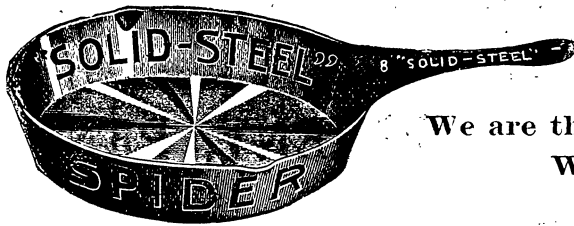
Morley Brothers,

123 N. Washington Ave., Saginaw, Mich.

49

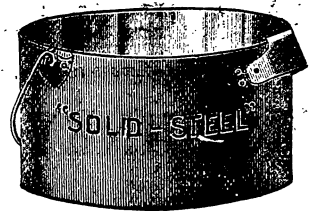
CHURCH PEW AND HOUSE NUMBERS,
Of Bronze Metal, in all Modern Finishes.
RANSON HARDWARE CO., Burlington, Vt.



"SOLID-STEEL" SEAMLESS HOLLOW WARE.

No Seams, no Rivets in "Solid-Steel" Ware.

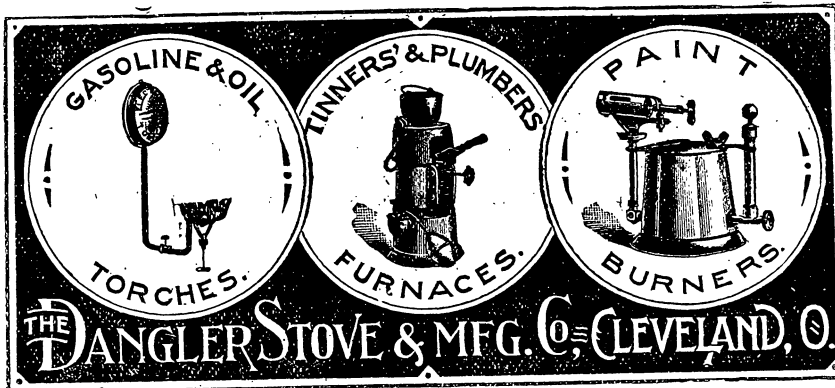
We are the leaders in Steel Hollow
Ware and all Sheet
Metal Work.



"Solid-Steel" Maslin Kettle.

The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.

**ALUMINUM**

Ingots, Sheets, Rods, Tubes, Wire and Castings, Cooking
Utensils and Table Ware, Tea and
Coffee Pots, Chafing Dishes, Rice Boilers, Tea Kettles, &c.

WRITE FOR THE WOHLER ALUMINUM COMPANY,
CATALOGUE. 55 Jackson Street, - Chicago, Ill.

Hudson's Garden Hose Mender.

So Simple a Child Can Use It.

Made in three sizes, for $\frac{1}{8}$ in., $\frac{1}{4}$ in. and 1 in. hose.

Put up in Boxes for Family use.

EACH BOX CONTAINS:

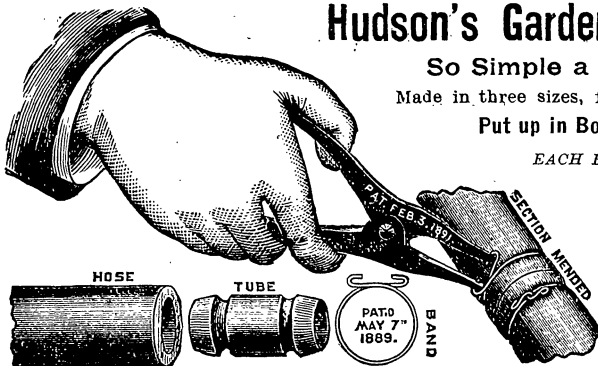
1 Pair Pliers,

20 Bands,

6 Tubes.

Sells readily at 75 cents.
Liberal discount to Dealers.

Send for Full Description.

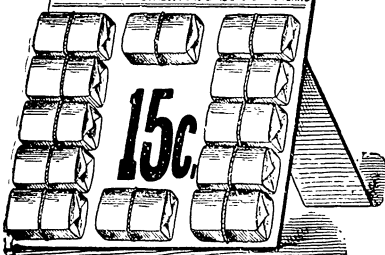


C. E. HUDSON & CO., Manufacturers, **Leominster, Mass.**

**IS YOUR RAZOR DULL?
RAZORINE**

(TRADE-MARK REGISTERED)
WILL SHARPEN THE Dullest RAZOR OR
MONEY REFUNDED
DIRECTIONS WITH EVERY PACKAGE

MANUFACTURED BY
THE RAZORINE MANUFACTURING CO.
OFFICE 2 WEST 14th STREET, N.Y.
DOES NOT INJURE THE RAZOR. ONE CAKE LASTS TWO YEARS

**RAZORINE**

(Trade-Mark Registered)

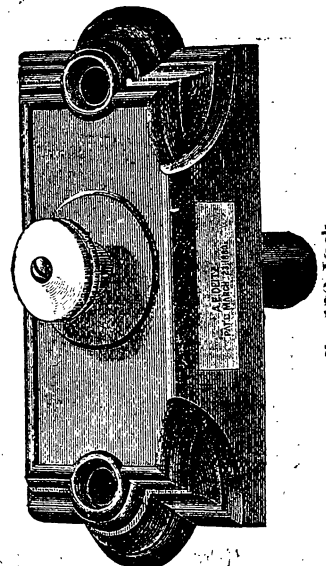
Will sharpen any razor without injury—every man
who shaves requires it.

SPECIAL OFFER:

We guarantee "Razorine" if given proper window
display to be positively the **BEST** selling article
at the price in the hardware trade. Let us mail you
a card. You need not pay for it until you sell it. Very
liberal margin.

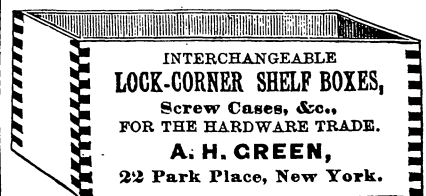
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N. Y. City.

BOOKS YOU CAN OBTAIN PROMPTLY the latest
work on any subject in which you are interested
by addressing **DAVID WILLIAMS, Publisher**
and Bookseller, 96-102 Reade Street, New York.

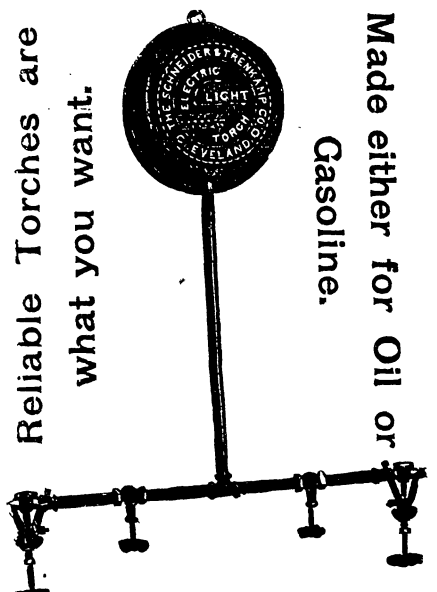
A. E. DEITZ.

No. 172 Lock.

J. C. McCARTY & CO., Agents, 97 Chambers
and 81 Reade Sts., New York.
Factory, **BROOKLYN, E. D., N. Y.**



Reliable Torches are
what you want.



Made either for Oil or
Gasoline.

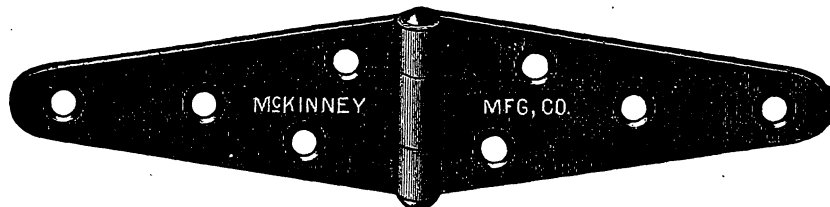
These Torches are particularly adapted for use in
factories, foundries, machine shops, rolling mills,
blacksmith shops, warehouses, &c. They make a
strong white light, are free from smoke and are not
affected by wind or rain. They are convenient and
portable. These Torches can be run at an expense of
about one-half cent to one cent per hour, burning a
bright, steady light which is ten times greater than
the light of an ordinary gas burner.
Write us for prices. A liberal discount given to the
trade. Manufactured by
THE SCHNEIDER & TRENKAMP CO.
Nos. 479 to 497 Case Ave., Cleveland, Ohio.

STEEL HINGES AND BUTTS.

STANDARD GOODS.

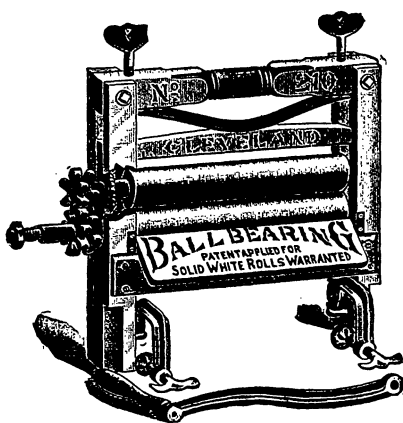
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SEND FOR
LIST.



ORDERS FILLED
ON SIGHT.

"NONE BETTER."



A GOOD PROFIT TO DEALERS

**A BALL BEARING WRINGER.
THE CLEVELAND**

Runs like a bicycle Very easy to operate, no other like it. Can be sold at higher prices and better profit than others, hence it pays to push it. It has been on the market over a year and is giving perfect satisfaction.

Send for Sample or Write for Catalogue and Prices.

ALL OTHER KINDS OF WRINGERS

THE PEERLESS MANUFACTURING CO.,

CLEVELAND, OHIO.

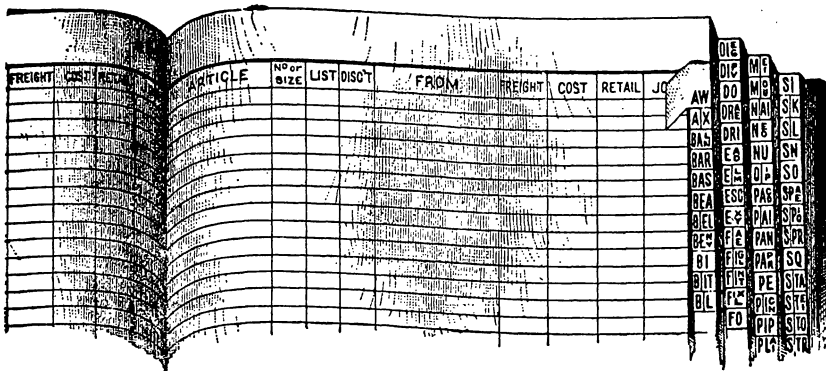
We also make High Grade Bicycles.

OSGOOD & HOWELL, Pacific Coast Agents,

132 Market St., San Francisco, Cal.

The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



AD	DI ⁵	MF	SI
AN	DI ⁷	MO	SK
AU	DO	NAI	SL
AW	DR ²	N ⁵	SN
AX	DRI	NU	SO
BA ⁷	E ^A _D	O ¹	SP ^E
BAR	E ^M	PA ⁵	SP ¹
BAS	ESC	PAI	SPR

Fac-Simile of Indexing.

SIZE.—The book is 8 1/4 x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

BINDING.—The binding is of the very best quality—flexible seal grained leather.

INDEX.—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.

Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

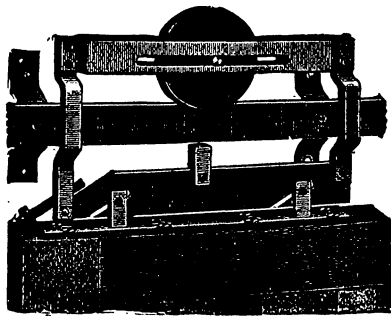
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THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.

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DAVID WILLIAMS, - - Publisher and Bookseller,

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LANE'S PATENT NOISELESS STEEL PARLOR DOOR HANGER.

This Hanger is made of Steel.
The Wheel is also Steel, except the filling or tread.
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The Hanger is Anti-Friction.
More nearly Noiseless than any other.
Ease of adjustment.

Can be erected with half the labor others require.
Track will not swell, shrink or warp out of true.
No cutting of doors.
No matching of hardware.
Simplicity in all its parts.
Durability.

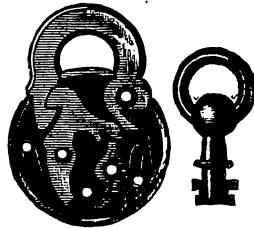
ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

Manufactured by

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JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., New York.

PATENT PERFECTION PADLOCK.



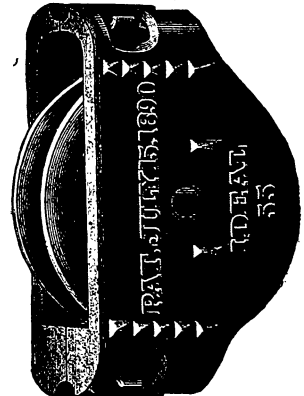
Eight Tumblers, Key Turning Both Ways.

Sizes, $\frac{1}{4}$ inch to $\frac{3}{4}$ inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also, $\frac{1}{2}$ and $\frac{3}{8}$ inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.
Adopted by the United States Treasury for bonded warehouses.

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Ideal Sash Pulley, No. 55.



Adapted for auger socket or machine made mortise. Applied without chisel or screws, quickly and a perfect fit in every case. The only all round Sash Pulley made. Sample free. Price on application.

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145 River St., Freeport, Ill.

SASH WEIGHTS

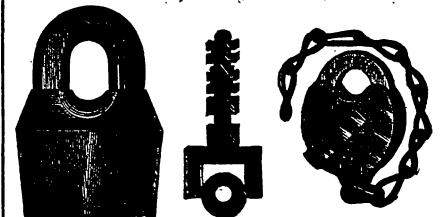
E. E. BROWN & CO.,

McKean and Meadow Sts.,
PHILADELPHIA, PA.

ESTABLISHED 1879.

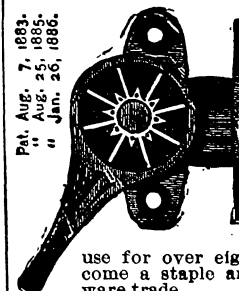
KEYSTONE LOCK WORKS.

E. T. FRAM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

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97 Chambers St., NEW YORK.



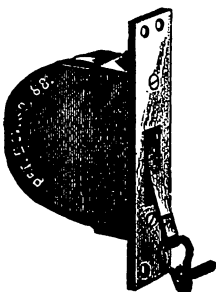
The Champion SIDE SASH LOCK

Has by its unequalled merits gained the public favor. It is a safe ventilator and prevents rattling. Is neat, cheap, simple and durable. It has been in extensive use for over eight years, and has become a staple article with the Hardware trade.

Beware of Worthless Imitations.

THE

Champion Safety Lock Co., Cleveland, O.



DOES IT PAY?

To buy an inferior article, which your trade condemns, when you can get

THE CALDWELL SASH BALANCE.

The best material, right principle and care in making and testing have made it the **LEADER** for five years. Write to

CALDWELL MFG. CO., Rochester, N. Y.

"VASSAR" CYLINDER LOCKS.

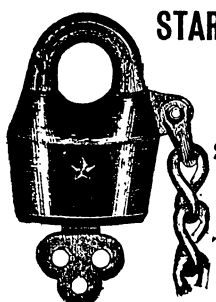
Are specified by Architects on first-class work everywhere.
They are Safest and Best.

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Hardware
Company.**



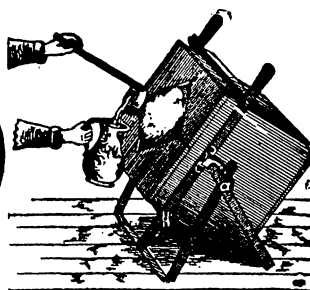
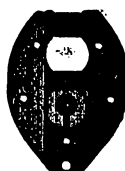
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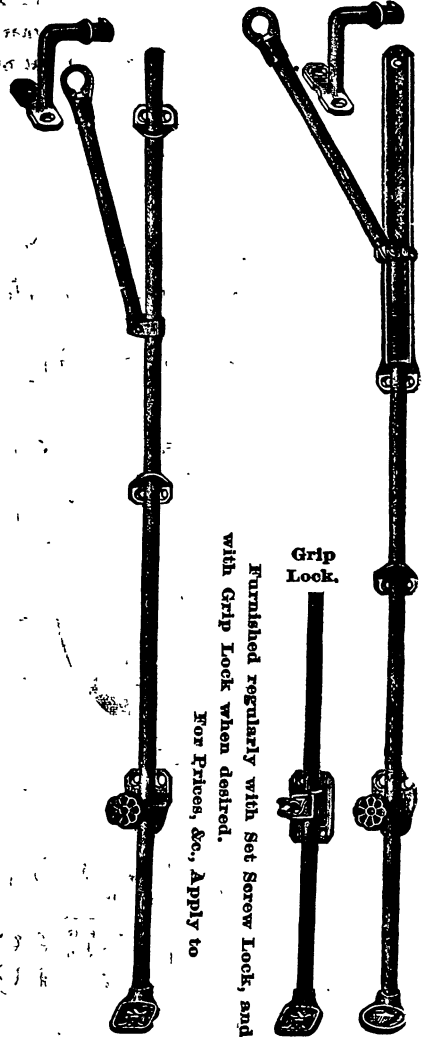
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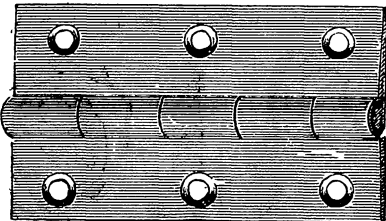
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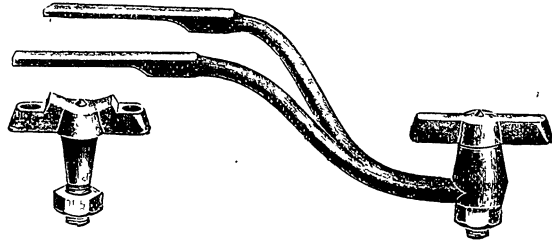
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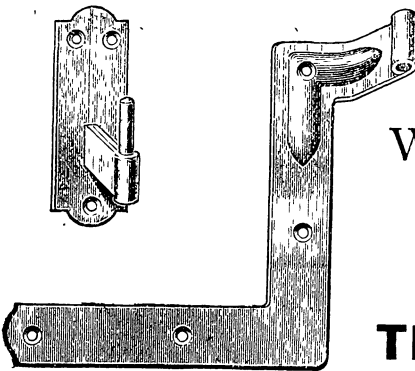
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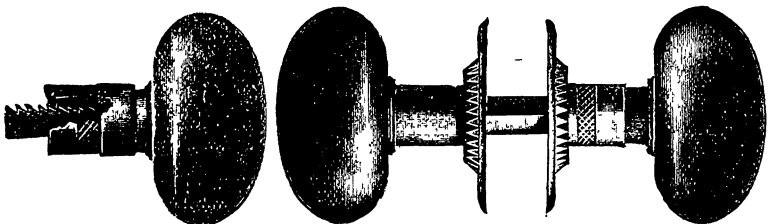
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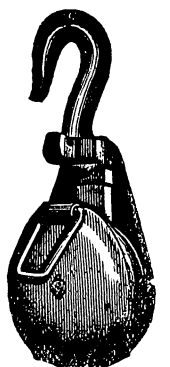
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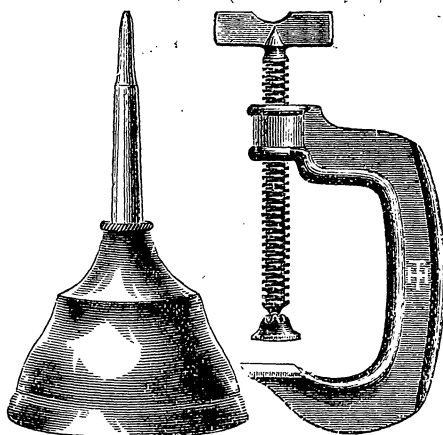
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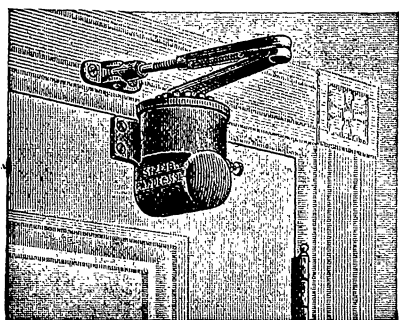
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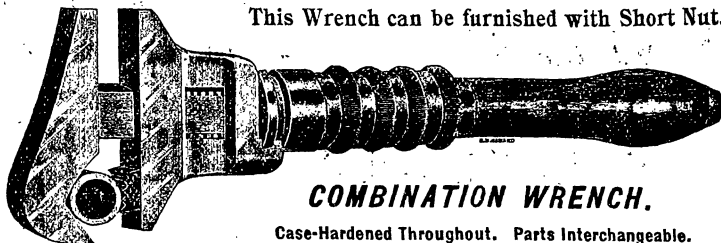
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Perfect in action, durable, neat in appearance, low
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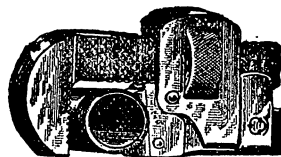


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Case-Hardened Throughout. Parts Interchangeable.

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the
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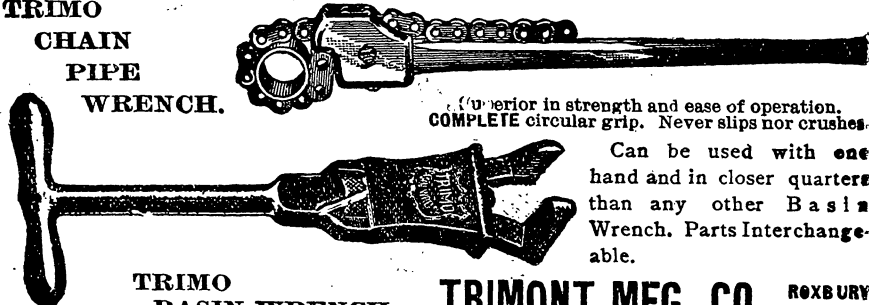
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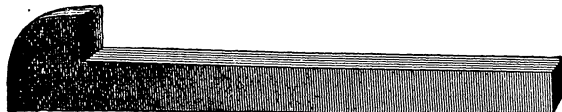
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(Eleven Sizes, 3-16 in. to 1 in. inclusive.)

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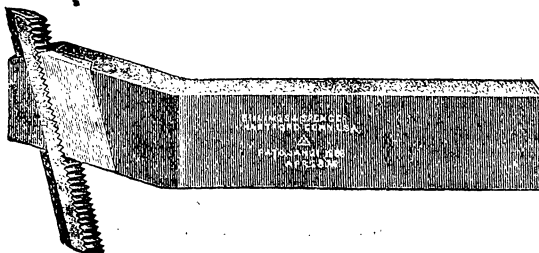


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Furnished in Two Sizes,
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Straight Holder.

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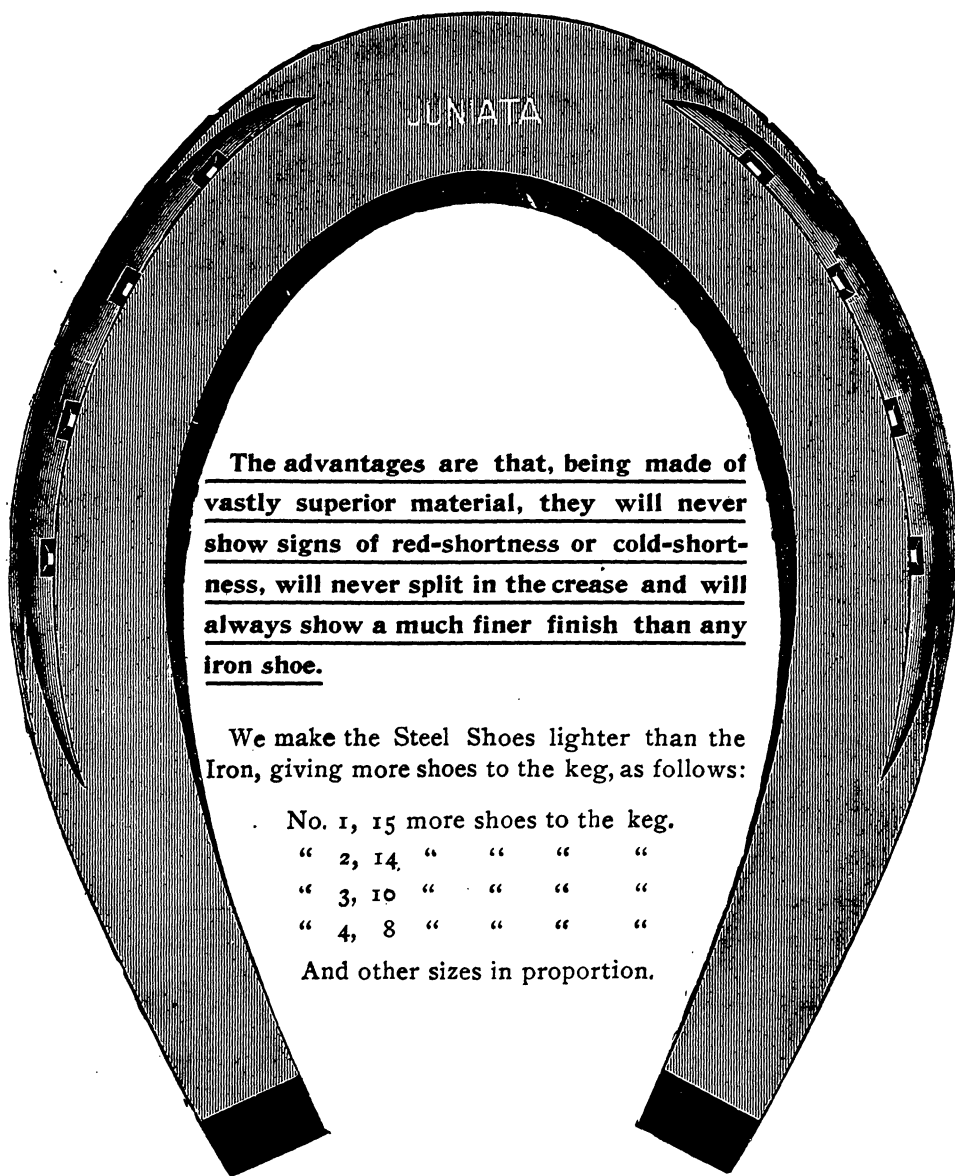
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SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



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We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

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" 3, 10 " " " "

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And other sizes in proportion.

No. 2 EXTRA SWAGED FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

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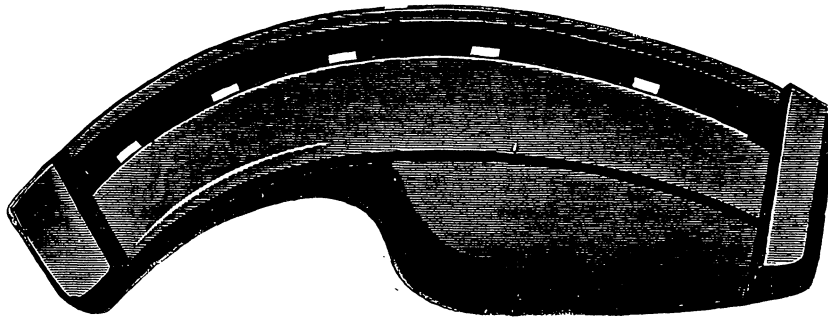
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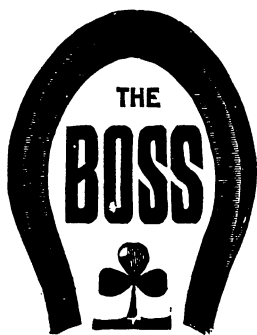
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Made under Deeble's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

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Beautiful Shape.

HORSE SHOES,

Light, Medium and Heavy.

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"Burden Best"

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“The Best Driving Nail.”

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“The Best Nail to Hold.”

HIGHEST AWARD. GOLD MEDAL.

CAPEWELL HORSE NAILS,

MADE BY

THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.

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The Capewell Patent Corrugated Horse Nail.

Needs No Clinching.

At Centennial Exposition AT PHILADELPHIA. **HIGHEST AWARD** At World's Columbian Exposition AT CHICAGO.

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HOT-FORGED AND HAMMER-POINTED

HORSESHOE NAILS.

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COUNTER HEADS for “Goodenough” shoes.
FRENCH HEADS for punched shoes, without creases.

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Of Best Material and Workmanship.

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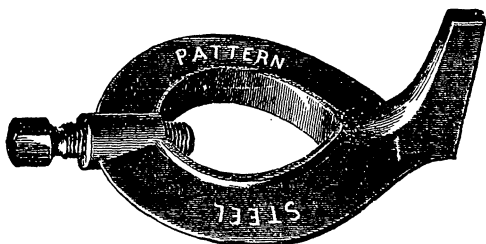
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No.	Inch.	Price.	No.	Inch.	Price.
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3.....	3/4	60	9.....	2 1/2	1 40
4.....	1	60	10.....	3	1 50
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Small set of 8, \$5.50. Full set of 12, \$12

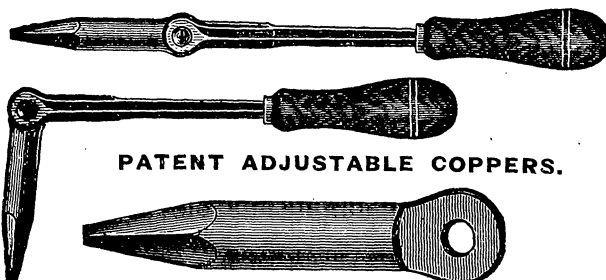
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It is a complete tool in every respect, and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.



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Manufacturers of
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TOE-CALKS.
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BURKE'S IMPROVED
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FOOT VICE.
Send for Circulars.
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BAR IRON.

CRESCENT HORSE SHOE
IRON CO.

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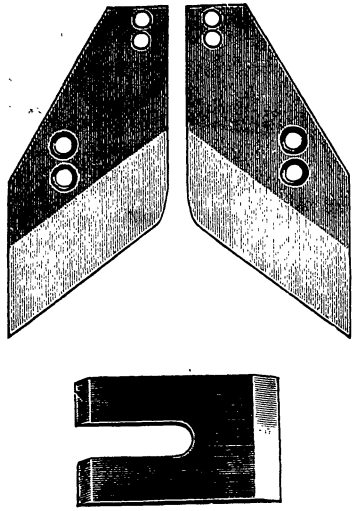
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Cut One-half Size.
Sample pair sent to any hard
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The Frost Thill Spring Co.,
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Bicycle and other Drop Forgings of every
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Estimates cheerfully given. Send for Catalogue.

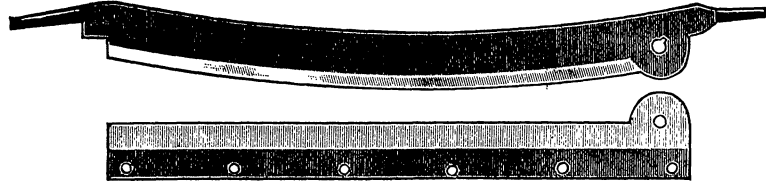


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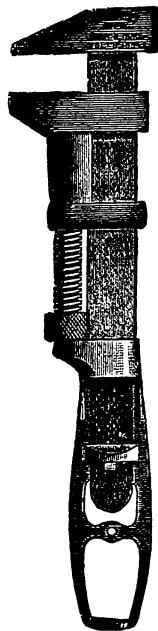
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Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.



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For ANTHRACITE AND BITUMINOUS MINING
SEAMLESS BRASS COLLAR
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6 DIFFERENT STYLES OF SPOUTS.
SAMPLE 15¢.
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Genuine Improved

KNIFE HANDLE

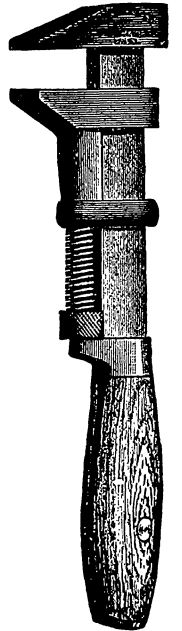
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Screw Wrenches

MANUFACTURED BY

COES WRENCH CO.,

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Established in
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Registered
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Patented July
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Patented July
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Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

Straight Bar, Extra Long Nut for Screw in Jaw.

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Made in Hay Manure and Spading Fork Patterns.

Heavy and long Steel Socket. Most elegant goods ever made.

The Iowa Farming Tool Co.,

Makers of

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RAKES,

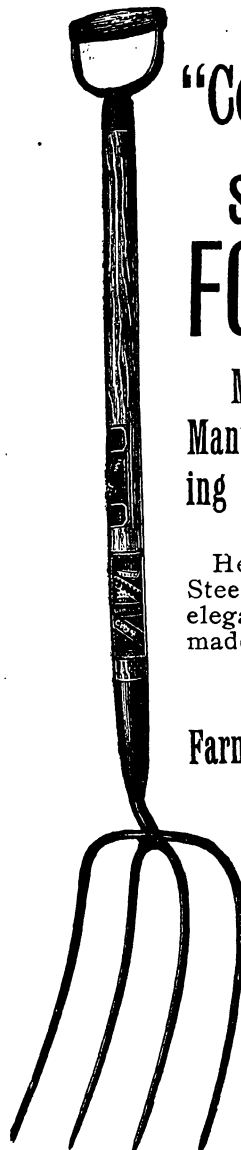
SCYTHE

SNATHS, Etc.

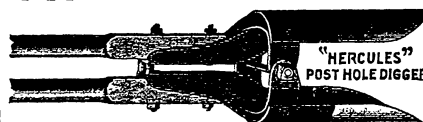
For export and home trade.

Catalog free on application.

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THE HERCULES.



A DIFFERENCE IN MATERIAL

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So any but Kohler's Post Hole Diggers make a difference—insist on your jobber and allow no substitute of post hole diggers, lawn rakes, curry combs, saw sets, etc. Manufactured only by

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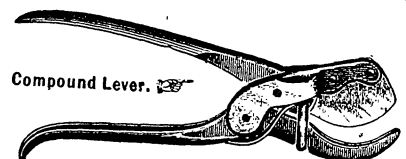
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Pattern Makers' Dowels and Emery Wheel Dressers
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"PERFECT" PRUNING SHEARS.



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A strictly first-class tool, entirely new in construction. Has a rapid action that produces a clean cut with twice the ease of other shears. Try a sample order and prove its superiority. We give it our full guarantee.

Our line comprises Lawn Rakes, Garden Rakes, Lawn Sprinklers, Post Hole Diggers, Curry Combs, etc.

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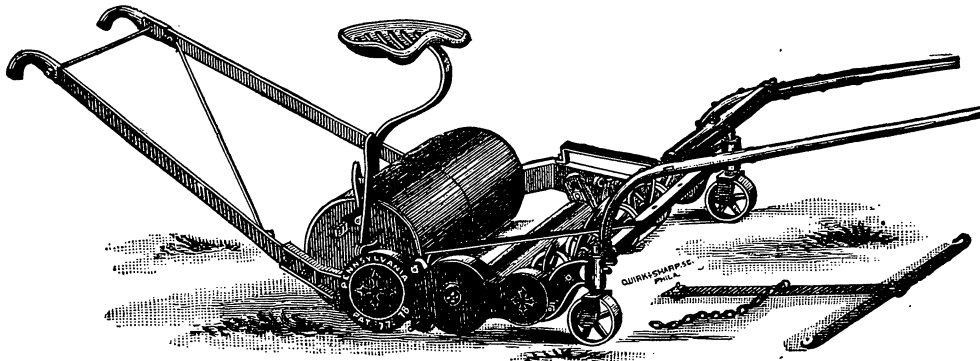
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PENNSYLVANIA HORSE LAWN MOWERS.

Made in
both open
and solid
cylinder.



Almost
noiseless
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operation

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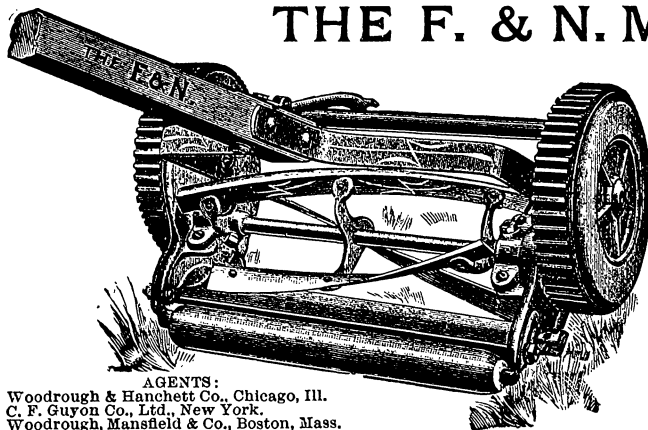
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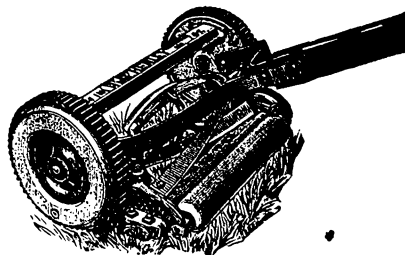
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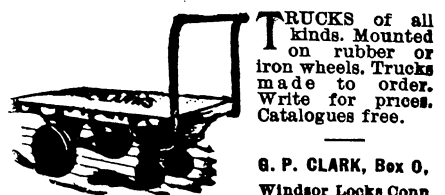
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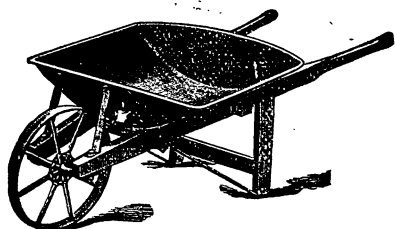


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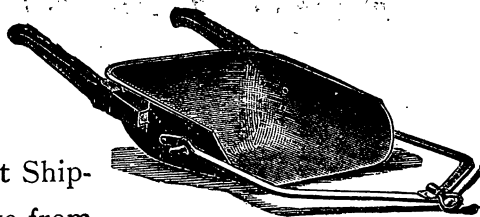
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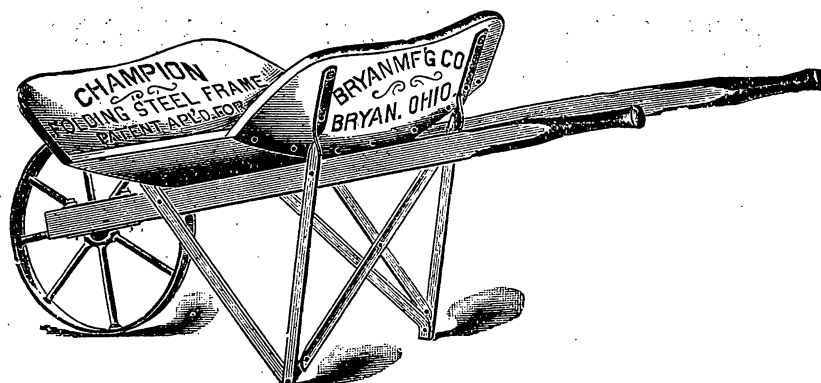
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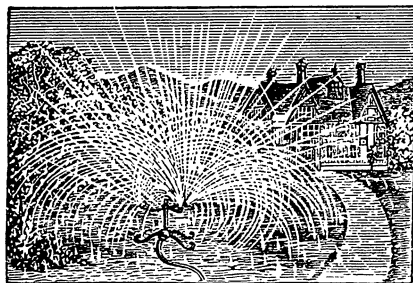
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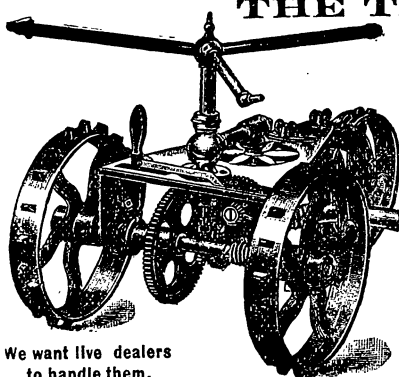
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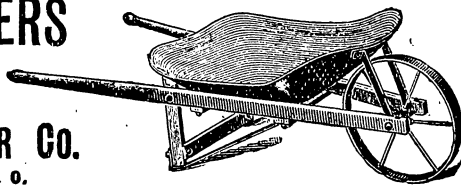
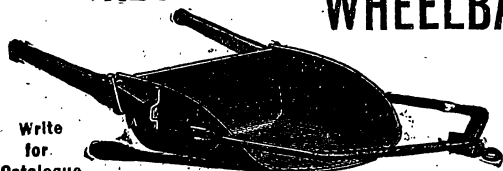
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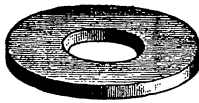
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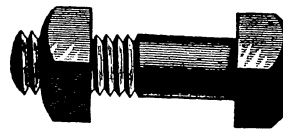
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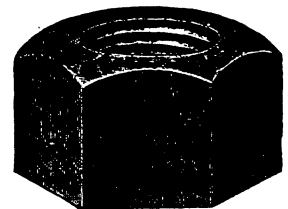
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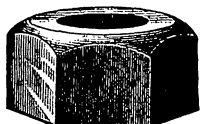
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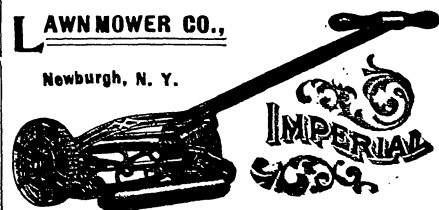
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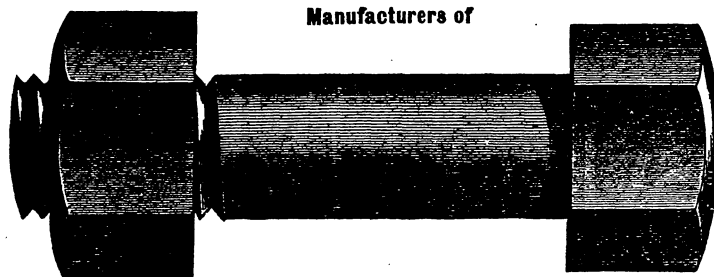
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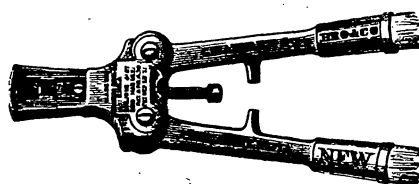
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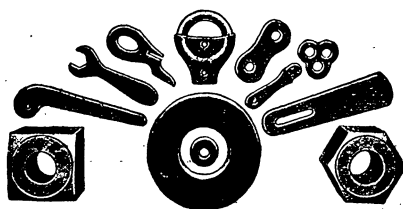
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Street, N. Y.

Conveying Machinery.

Brown Hoisting & Conveying Machine
Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Copper.

Ames Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21
Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 294 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Wister, Francis, Philadelphia, Pa.

Cordage.

Samson Cordage Works, Boston, Mass.

Cork Screws.

Williamson, C. T. Wire Novelty Co.,
Newark, N. J.

Corn Binder.

Tie Co., Unadilla, N. Y.

Corrugated Furnaces.

Continental Iron Wks., Brooklyn, N. Y.

Corrugated Iron.

Cincinnati Corrugating Co., Piqua, O.
Cambridge Roofing Co., Cambridge,
Jersey City Galvanizing Co., 112 John
St., N. Y.
Moseley Iron Bridge & Roof Co., 5 Day,
N. Y.
N. Y. Iron Roofing & Corrugating Co.,
Jersey City, N. J.

Counting Machines.

Durant, W. N., Milwaukee, Wis.

Cranes.

Halsey, W. S. & Co., Birdsboro, Pa.
Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville,
Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Whiting Foundry Equipment Co., Chi-
cago, Ill.
Yale & Towne Mfg. Co., Stamford,
Conn.

Cupolas, Hot Blast.

Whiting Foundry Equipment Co., Chi-
cago, Ill.

Cutlery, Importers of.

Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.

Bingham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston,
Mass.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northamp-
ton, Mass.
Wilson, John, Sheffield, England.

Cutlery Display Cases.

Union Show Case Co., Chicago, Ill.

Cyclometers.

Bridgeport Gun Implement Co., 313-
315 Broadway, N. Y.

Dampers.

Arcade Mfg. Co., Freeport, Ill.
Shepard, Sidney & Co., Buffalo, N. Y.

Dies.

Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.

Bliss, E. W. Co., Brooklyn, N. Y.

Door Checks and Springs.

Bardsley, J., 149 & 151 Baxter St., N. Y.

Door Knobs.

Perry & Whipple Co., New Haven, Ct.

Door Springs.

Coiled Wire Belting Co., Jersey City,
N. J.

Drilling Machines.

Bickford Drill & Tool Co., Cin., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lan-
caster, Pa.
Colburn, A. M., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Dwight Slate Machine Co., Hartford,
Conn.
Goddard, Jas., Worcester, Mass.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Penna. Diamond Drill & Mfg. Co.,
Birdsboro, Pa.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Wiley & Russell Mfg. Co., Greenfield,
Mass.

Drop Forgings.

Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Boonton, N. J.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, E. D.
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
Wilcox & Howe Co., Birmingham,
Conn.
Williams, J. H. & Co., Brooklyn, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport,
Conn.
Wyman & Gordon, Worcester, Mass.

Drop Presses.

Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven,
Conn.
Stiles & Parker Press Co., Brooklyn,
N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Ma-
chine Co., Waterbury, Conn.

Dumb Waiters.

Hutchinson, F. S. Co., 32 Warren Street,
N. Y.
Storm Mfg. Co., Newark, N. J.

Dynamite.

Eng Beaters.

North Bros. Mfg. Co., Philadelphia, Pa.

Electric Bells and Supplies.

Ostrander, W. R. & Co., 204 Fulton St., New York.
Wollensak, J. F., Chicago, Ill.

Elevators, Makers of.

Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Penna. Elevator Engineering Co., Phila., Pa.

Emery and Emery Wheels.

N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., N. Y.

Emery Wheel Dressers.

Bay State Stamping Co., Worcester, Mass.

Engineers and Contractors.

Aiken, Henry, Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. E., Co., Pittsburgh, Pa.
McCure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.

Engines, Gas and Gasoline.

Buckeye Mfg. Co., Union City, Ind.
Otto Gas Engine Works, Phila., Pa.
Springfield Gas Engine Co., Springfield, Ohio.

Engines, Steam, Makers of.

Bass Foundry & Machine Works, Ft. Wayne, Ind.
Harris, Wm. A. Steam Engine Co., Providence, R. I.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Southwark Foundry & Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.

Sweetser, W. A., Brockton, Mass.

Expansion Bolts.

Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.

Exporters.

Flint & Co., 68 Broad St., N. Y.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden, Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters and Purifiers.

Davis, I. B. & Son, Hartford, Conn.
Harrison Safety Boiler Works, Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.

Fencing, Iron and Wire.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Chess Bros., Pittsburgh, Pa.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Newburgh, N. Y.
Randall Fence Co., Le Roy, N. Y.
The Van Dorn Iron Works Co., Cleveland, O.

Files, Importers of.

Moss, F. W., 80 John St., N. Y.

Files and Rasps, Manufacturers of.

Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond, Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.

Fire Brick, Makers of.

Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer, B. & Sons, Foot E. Houston St., N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro. Co., Woodbridge.

Fire Doors.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

Forks, Hay and Manure.

Iowa Farming Tool Co., Ft. Madison, Iowa

Foundry Facings.

Dixon, Jos., Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.
Smith, J. D., Fdy. Supply Co., Cinnc., O.

Foundry Riddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Rice Mfg. Co., New Durham, N. H.
Smith, J. D., Fdy. Supply Co., Cinnc., O.
Smith's Pattern Works, Akron, Ohio.

Friction Clutches.

Brown, A. & F., 17 Day St., N. Y.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.

Evans Friction Cone Co., Boston, Mass.

Galvanized Material.

Jersey City Galvanizing Co., 112 John St., N. Y.

Galvanizing Kettles.

Sands, Thos., Nashua, N. H.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Fitters' Supplies.

Pancoast, Henry B. & Co., Phila., Pa.

Gate Hinges.

Wrightsville Hdw. Co., Wrightsville, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London, Conn.

Gears.

Boston Gear Works, Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
Lincoln Iron Works, Rutland, Vt.
Poole, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.

Grass Catchers.

Supplee Hardware Co., Phila., Pa.

Grinding and Polishing Machines.

Norton Emery Wheel Co., Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stove Co., Cleveland, O.

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray St., N. Y.

Handles.

Cleveland Wood Turning Co., Cleveland, O.

Hangers, Door.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.

Hardware Comm'n Merchants.

Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Jobbers.

White, Van Glahn & Co., 15-17 Chatham Square, N. Y.

Hardware Manufacturers.

Stearns, E. C. & Co., Syracuse, N. Y.
Streeter, N. R. & Co., Groton, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs.' Agents.

Bingham, W. Co., Cleveland, O.
Clarke, Thomas St. John, N. B.
Graham, John H. & Co., 113 Chambers.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Berger Bros., Philadelphia, Pa.
Bourke Mfg. Co., Youngstown, O.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Johnson, S. C., Racine, Wis.
New Britain Hdw. Mfg. Co., New Britain, Conn.

North Bros. Mfg. Co., Philadelphia, Pa.
Ranson Hdw. Co., Burlington, Vt.
Scranton & Co., New Haven, Conn.
Shepard, Sidney & Co., Buffalo, N. Y.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville, Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E., Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Lincoln Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 28 Warren St.
Maris & Beekley, Philadelphia, Del.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speldel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.

Hollow Ware, Aluminum.

Wohler Aluminum Co., Chicago, Ill.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.

Horse and Mule Shoes, Makers of.

Bryden Horse Shoe Co., Catsauqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Spenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.

Hose Menders.

Hudson, C. E. & Co., Leominster, Mass.

Hose.

N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F., 26 Warren St., N. Y.

Ice Cream Freezers.

North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tammal & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Busenius & Cunliffe, Philadelphia.
Corning, Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 60 B'way, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.

Iron Sheet, Manufacturers of.

Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
The Van Dorn Iron Works Co., Cleveland, O.

Keys.

Wollensak, J. F., Chicago, Ill.

Knife and Tool Grinders.

Tracy, A. J. Co., Ltd., 18 Cliff St., N. Y.

Ladies.

Whiting Fdy. Equipment Co., Chicago, Ill.

Lanterns.

Rochester Lamp Co., 42 Park Place, New York.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.

Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr. & Co., Philadelphia, Pa.
New Haven Mfg. Co., New Haven, Conn.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Expanded Metal.

Chess Bros., Pittsburgh, Pa.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Lawn Mowers.

Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
Coldwell Lawn Mower Co., Newburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
F. & N. Mfg. Co., Richmond, Ind.
Hensley, M. C., Richmond, Ind.
Supplee Hdw. Co., Phila., Pa.

Lawn Rakes.

Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.

Lawn Sprinklers.

Blair Mfg. Co., Springfield, Mass.
Enterprise Mfg. Co., Phila., Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Graham, John H. & Co., 113 Chambers Street, N. Y.
McGowan, John H. Co., Cincinnati, O.
Portland Lawn Sprinkler Co., Portland, Me.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, C. F. & Son, Athol, Mass.

Locks and Knobs, Manufacturers of.

Deitz, A. E., 97 Chambers, N. Y.
Independent Electric Co., Chicago, Ill.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.

Lubricants.

Dixon, Jos., Crucible Co., Jersey City, N. J.

Machinery.

Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & John, Rockford, Ill.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dey, N. Y.
Bisnal & Ketchum, St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Bridgeport Mch. Tool Works, Bridgeport, Conn.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Lajght & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Henderer, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Hulbur-Rogers Mch. Co., Southbury, Mass.
Johnson, Israel H., Jr. & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinery's Supply Co., Rochester, N. Y.
Manville, E. J., Mch. Co., Waterbury, Conn.
Newark Mch. Tool Wks., Newark, N. J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Place, Geo., 145 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons, L. F., Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Conn.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Walker Mfg. Co., Cleveland, O.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Simonds Mfg. Co., Fitchburg, Mass.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
- Machine Screws.**
 Hubbell, Harvey, Bridgeport, Ct.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
- Machine Tools.**—See Machinery.
- Machine Work.**
 Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starratt, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**
 Harmon, T. H., Lock Haven, Pa.
- Measuring Tapes.**
 Keuffel & Esser Co., N. Y.
- Meat Choppers.**
 Clauss Shear Co., Fremont, Ohio.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**
 Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mining Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Models, Makers of.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Money Drawers.**
 Columbian Novelty Co., North East, Penna.
- Motors, Water and Electric.**
 Bolgiano Mfg. Co., Baltimore, Md.
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
- Nickel Plating.**
 Rhodes, L. E. Co., Hartford, Conn.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Franklin, H. H. Mfg., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Russell, Burdiss & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
 Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Independent Electric Co., Chicago, Ill.
 Wolf, W. & L., Phila., Pa.
- Pills.**
 Richmond Cedar Wks., Richmond, Va.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howard & Cowson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pancoast, Henry B. & Co., Phila.
 Saunderson's Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Aetna-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead-McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Ladin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**
 Millers Falls Co., 93 Reade St., N. Y.
- Power Hammers.**
 Dlenelt & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellefonte, Pa.
 Long & Allstatter Co., Hamilton, Ohio.
 Miner & Peck Mfg. Co., New Haven, Conn.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Merriam, A. H., Meriden, Conn.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printers.**
 Griffith, Axtell & Cady Co., Holyoke, Mass.
- Pruning Knives.**
 Gibbs Mfg. Co., Canton, O.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
- Pulverizing Mills.**
 Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker-Colville Steam Pump Co., St. Louis, Mo.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**
 Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Myers, F. E. & Bro., Ashland, O.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Henderer, A. L., Wilmington, Del.
 Long & Allstatter Co., Hamilton, Ohio.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Estey, W. S., 65 Fulton, N. Y.
- Razor Guard.**
 Murphy, P. D., Lockport, N. Y.
- Razor Sharpener.**
 Dame, Stoddard & Kendall, Boston, Mass.
 Razorine Mfg. Co., 2 W. 14th St., N. Y.
- Razors, Manufacturers of.**
 Torrey, J. R. Razor Co., Worcester, Mass.
- Reels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**
 Conroy, P. J. & Co., Philadelphia.
- Rivets.**
 Blake & Johnson, Waterbury, Conn.
 Boyce Rivet Co., Muncie, Ind.
 Burden Iron Co., Troy, N. Y.
 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. F. & Co., New Brighton, Pa.
- Riveting Machines.**
 Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**
 Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago Fdry Co., Chicago, Ill.
 Garrison, A. Fdry Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Roofing.**
 Cambridge Roofing Co., Cambridge, O.
 Cincinnati Corrugating Co., Piqua, O.
 Kanneberg Roofing Co., Canton, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Keuffel & Esser Co., New York.
 Stanley Rule & Level Co., 29 Chambers.
- Rust Preventive.**
 Bridgeport Gun Implement Co., 312-316 Broadway, N. Y.
- Sad Irons.**
 Streeter, N. R. & Co., Groton, N. Y.
- Sad Irons, Gas.**
 Bolgiano Mfg. Co., Baltimore, Md.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Fullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 65 Elizabeth, N. Y.
 Ossawan Mills Co., Norwich, Conn.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Locks.**
 Champion Safety Lock Co., Cleveland, Ohio.
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E. & Co., Philadelphia, Pa.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Disston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Disston, Henry & Sons, Phila., Pa.
 National Saw Co., 86 Reade St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.
- Scrapers, Road.**
 Am. Steel Scraper Co., Sydney, Ohio.
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket, Mass.
 Miles, F. S., 205 Quarry, Philadelphia.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Scythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Station, N. H.
 Cleveland Stone Co., Cleveland, O.
- Sever Pipes.**
 Sharon Clay Mfg. Co., Sharon, Pa.
- Shade Hangers.**
 South, W. A. Co., Salem, Mass.
- Shaft Coupling.**
 Columbian Novelty Co., North East, Penna.
- Shafting, Makers of.**
 Brown, A. & F., 17 Dey St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**
 Aetna-Standard Iron & Steel Co., Bridgeport, O.
 East Chicago Fdry Co., Chicago, Ill.

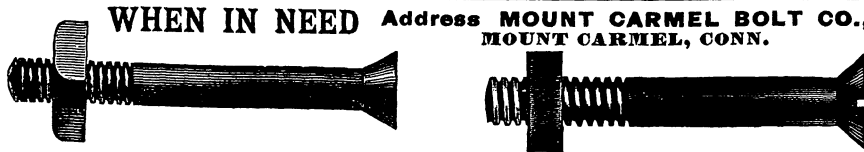
- Allentown Rolling Mill**, Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Etna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleane Co., Pittsburgh, Pa.
Pierson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Atlas Mfg. Co., New Haven, Conn.
- Show Cases.**
Union Show Case Co., Chicago, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**
Keene Mfg. Co., Keene, N. H.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Slag Machines.**
Cambla Iron Co., Johnstown, Pa.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St. N. Y.
Wollensak, J. F., Chicago, Ill.
- Spelter.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
Missouri Metal Co., St. Louis, Mo.
- Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
Hartley & Graham, 313-315 B'way, N. Y.
- Springes.**
Clark & Cowles, Plainville, Ct.
Colled Wire Belting Co., Jersey City, N. J.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Tuck Mfg. Co., Brockton, Mass.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
Bommer Bros., Brooklyn, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Edw. Co., 14 Warren St., N. Y.
- Stamping Works.**
Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener, E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
Bristol Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburg, Pa.
- Steam Heating & Oil Separators.**
Webster, Warren & Co., Camden, N. J.
- Steam Separators.**
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N. J.
- Steam Specialties.**
Lunkenhelmer Co., Cincinnati, O.
- Steel, Cold Rolled Strip.**
Superior Steel Co., Pittsburgh, Pa.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabet.**
Krogsrud, W., 61 Fulton St., N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wethorell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Etna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Hermann & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Present Steel Co., Pittsburgh, Pa.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorhead-McCleane Co., Pittsburgh, Pa.
Moore, F. W., 83 John, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Bowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Superior Steel Co., Pittsburgh, Pa.
Wordlaw & C. Co., 28 E'way, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
Barns, C. K. & Co., Philadelphia, Pa.
Butze, Adolph, St. Louis, Mo.
Cornish, Edw. & Co., 28 E'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders, Rolling.**
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Crossant, M., Albany, N. Y.
Morley Bros., Saginaw, Mich.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Oster Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.**
Lincoln Iron Works, Rutland, Vt.
- Stove Linings.**
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**
Cheney, S. & Son, Manlius, N. Y.
- Street Lamps.**
Rochester Lamp Co., 42 Park Place, New York.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Structural Iron Work.**
Lindsay, Jas. G. & Co., Phila., Pa.
- Sulphuric Acid.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
Atlas Tack Corporation, Boston, Mass.
Chess Bros., Pittsburgh, Pa.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
- Taps and Dies.**
Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Riehle Bros. Testing Mach. Co., Philadelphia.
- Testing Machines.**
Riehle Bros. Testing Mach. Co., Phila.
- Theatrical Hardware.**
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.
- Thrust Collars.**
Gouverneur Mach. Co., Gouverneur, N. Y.
- Timber and Mineral Lands.**
Robertson, E. Co., Cincinnati, O.
- Time Record.**
Scattergood, H. W., Phila., Pa.
- Tin Plate Machinery.**
Lloyd Booth Co., Youngstown, Ohio.
- Tinning Process.**
Sands, Thos., Nashua, N. H.
- Tire Upsetters.**
Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**
Burke, P. F., Boston, Mass.
- Tool Blocks.**
Hulbut-Rogers Mch. Co., South Sudbury, Mass.
- Tool Chests.**
Am. Tool Co., 200 W. Houston St., N. Y.
- Tool Holders.**
Armstrong Bros. Tool Co., Chicago, Ill.
- Tools.**
Brown, R. H. & Co., New Haven, Conn.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 93 Reade, N. Y.
Richards, C. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers.
Starrett, L. S., Athol, Mass.
Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.
- Tools, Blacksmith and Wheelwright.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasoline.**
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.**
Wollensak, J. F., Chicago, Ill.
- Trucks, Manufacturers of.**
Clark, G. P., Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.**
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
Avery Stamping Co., Cleveland, O.
Ing's, John S. Son & Co., 4 Fletcher St., New York.
U. S. Projectile Co., Brooklyn, N. Y.
- Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lunkenhelmer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John, N. Y.
- Ventilator Appliances.**
Howard & Morse, 45 Fulton St., N. Y.
- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 93 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay, N. Y.
- Wagon Jacks.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Newbury, Jay Herbert, Gunderland, N. Y.
Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**
Richmond Cedar Wks., Richmond, Va.
- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**
Amer. Steel Scraper Co., Sidney, Ohio.
Bryan Mfg. Co., Bryan, Ohio.
Sidney Steel Scraper Co., Sidney, O.
- Window Cleaners.**
Bourke Mfg. Co., Youngstown, O.
- Window Cord, Makers of.**
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Prentiss, Geo. W. & Co., Holyoke, Mass.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 85 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff.
Howard & Morse, 45 Fulton, N. Y.
Ludlow-Saylor Wire Co., St. Louis, Mo.
N. J. Wire Cloth Co., Trenton, N. J.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.
- Wire Cutters.**
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John St., N. Y.
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Scheeler & Sons, Buffalo, N. Y.
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Williamson, C. T., Wire Novelty Co., Newark, N. J.
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- Wire Machinery.**
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- Wire Straightening and Cutting Machinery.**
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- Wire Nails.**
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Egan Co., Cincinnati, Ohio.
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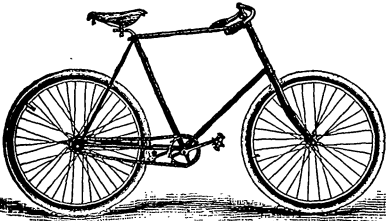
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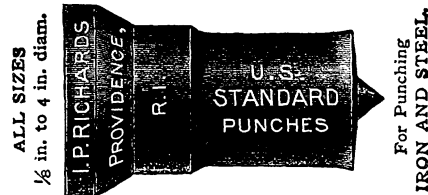
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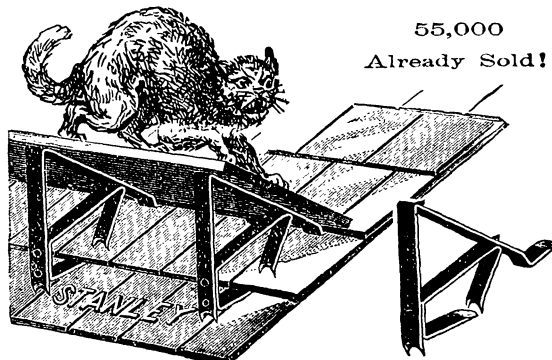
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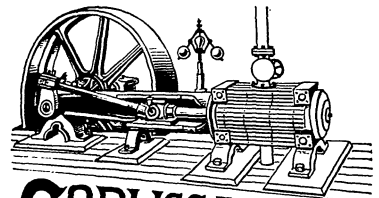
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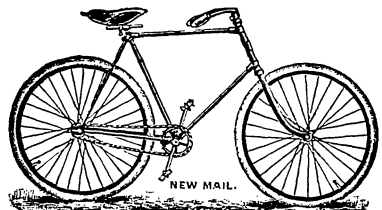


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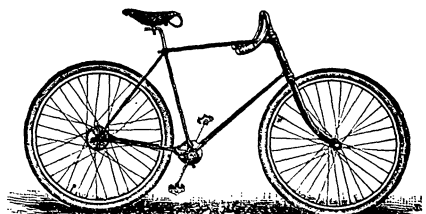
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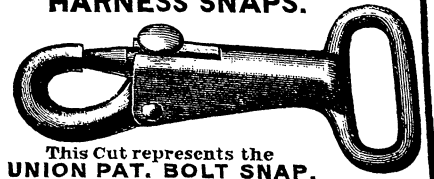
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This machine—designed and built by the Pratt & Whitney Company of Hartford, Conn.—is intended especially for drilling valve flanges in square, circular, or other forms, of from 7 to 20½ inches diameter. It drills from 1 to 16 holes at a time, of ¼ to 1½ inch diameter and 2½ inches or more apart. Upon each drill spindle is a pinion which engages with an internal gear carried by the shaft upon which the large driving gear is mounted. Each spindle consists practically of three parts—the portion carrying the pinion by which it is driven; an outer adjustable section carrying the drill; and a central part uniting the two. This central part is

by 6½ inches face. The weight of the machine with the countershaft is 9300 pounds.

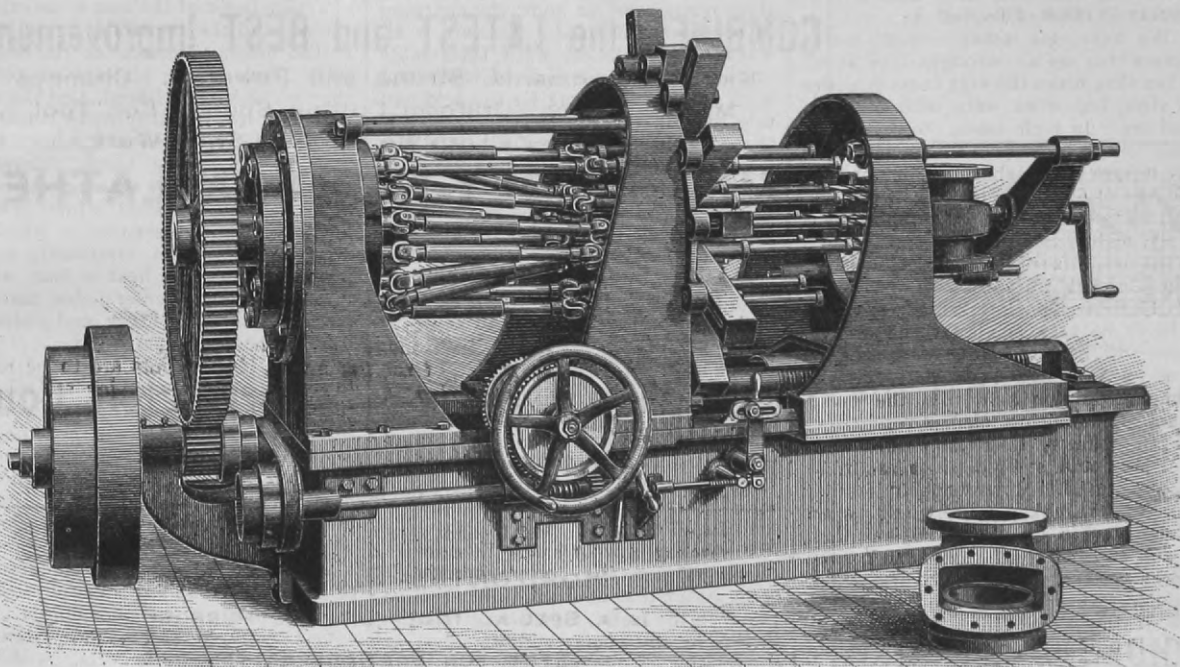
A Milwaukee and Chicago Belt Line.

A project is now ripening to build in Milwaukee terminals of sufficient size to accommodate seven large railroads and also to construct a road along the lake shore from Milwaukee to Waukegan. There it is to connect with the outer Chicago belt line. One of the purposes of the new road is to furnish all the Chicago railroads with Milwaukee connections. New York, Chicago and Milwaukee capitalists are said to be backing the scheme. It is said that since January the promoters of the road have been busy getting the right of

The promoters say their line will be completed in two years. The company will own no more rolling stock than is necessary for suburban traffic. It is expected that not only will such a road greatly benefit existing railroad traffic, but that it will also be the means of inducing other railroads to build branches to Milwaukee.

Aluminum Boats.

The use of aluminum in the construction of torpedo boats and other craft designed to attain a high rate of speed with lightness of build is receiving considerable attention from European naval authorities. A new torpedo gunboat built for the French Government is thus described and com-



ADJUSTABLE 16-SPINDLE DRILLING MACHINE.

united to the two end parts by universal joints and is formed with a splined connection to permit the radial adjustment of the drill carrying end. The front bearing of the spindles is set in slotted radial arms and is 9 inches by 1½ inches in diameter. In setting the drills the jig is bolted to the carriage, the drills are inserted in the jig holes, when the radial arms are adjusted to bring the drills into proper line and are then clamped.

The carriage has power feed with automatic adjustable knock-off. The feed screw is fitted with ball bearing for taking the end thrust; the feed cones have three grades giving feed from 1 to 3 inches per minute. The driving cone has two grades, 28 and 24 inches in diameter, for a 4-inch belt; the ratio of gearing to spindles is three to one. The change of adjustment from one size or shape to another can be made in from 5 to 15 minutes. The spindles are intended to make 120 and 164 revolutions per minute. The countershaft runs 420 revolutions per minute and has tight and loose pulleys 18 inches in diameter

way, which runs through the chief manufacturing portion of the city to the foot of Broadway.

The road is to enter Milwaukee on the southwestern outskirts, where 64 acres have been secured for outer terminal yards. From there it is to run in a northeasterly direction through the southern portion of the Menominee Valley, paralleling the St. Paul tracks along Burnham's Slip and the South Menominee Canal, giving more than 3000 feet of dock frontage. From this point it will cut through the northern portion of the south side to the company's inner terminal property, which is to be located between Lake and South Water streets and between the south yards of the St. Paul and Northwestern Railroads. The inner terminals will include dock frontage on the river.

From the outer terminal yards lines and spurs will, it is said, be built to the various suburbs. The inner terminal yard is to cover 16 acres and have room for seven tracks. It will be bounded by Lake, Barclay, Oregon and Clinton streets.

mented upon by the *British Naval and Military Record*:

The boat is constructed of aluminum and its extreme lightness will allow of its traveling at the rate of 31 knots an hour. This speed will beat the record, which at the present time is 29.3, obtained by the new Thornycroft torpedo gunboat trials a few days since. There is no doubt that aluminum is the coming metal, and will be used a great deal in ship construction. As the little launch, which came out at the Henley regatta, can move as fast as other launches of the same size with half their power, it is fairly certain that it will supersede the present brass fittings of the torpedo gunboats, which are very weighty. Another matter to be borne in mind is the fact that it will be possible to carry more coal if the boats can be made lighter in construction.

The Chilean Council of State has decreed that after December next customs dues are to be paid 25 per cent. in gold and the remainder in paper, plus the surcharge of the rate of exchange.

The Manufacture of Open Hearth Steel in Sweden—II.*

BY ERIK G:SON ODELSTJERNA ENGINEER
OF THE JERNKONTORET, FILIPSTAD,
SWEDEN.

The Process.

As the fuel is with us the most expensive item (coal, for instance, costing us at the works about \$6 per ton), we try, above all, to reduce the fuel consumption to a minimum by covering the furnaces† and by driving the process as fast as is consistent with the best quality of the product. I suppose many foreign engineers may be surprised that, with our attention mainly directed on this point, we have, nevertheless, not got below a fuel consumption (for coal) of 20 to 25 per cent. of the weight of the steel produced. But it must be kept in mind that, partly for the lack of good soft scrap and partly also because we believe that we get a better product the more pig iron and the less scrap we use, we work with a high pig iron percentage and consequently consume more time to each heat than is customary in other countries.

We have, for instance, steel works here which use no wrought iron at all when they make the very finest qualities of steel, but work only with pig iron and ore. In such cases, however, the fuel consumption rises somewhat above the figures given above, which are for charges of 60 to 70 per cent. of pig iron and 30 to 40 per cent. of scrap respectively, melted in 10-ton furnaces, which is the usual size of our modern furnaces. The largest furnaces we have are of 15 tons capacity, which may be said to be very small for the present time and in comparison with what is used in America. It is, however, the common opinion here that the maximum advantageous size is reached at 10-ton charges, if strictly first-class tool steel and steel castings are to be manufactured. Moreover, but few of our works make entirely soft open hearth steel in quantities large enough to run 40 to 50 ton furnaces, and these works prefer, so far, to use three smaller furnaces instead of one large one, fearing to get an inferior and not entirely uniform product. It is possible that on this point we are too conservative, and that we could learn to make in much larger furnaces just as tough and uniform metal; but as it is our object to produce an open hearth steel in every respect fully equal to the best crucible steel, the difficulties of a furnace of more than 10 tons charge capacity are as yet too great for us. It should be added that most of our works make steel castings, also and that these are ordered (or ought to be) of different quality for different purposes; so that it is impossible to be always so well supplied with orders that charges of over 10 tons could be regularly tapped. But if a 25 or 50 ton furnace is run at times with small charges, to make castings, the fuel consumption is ruinous; while on the other hand we do not like to run with full charges for steel castings and cast the rest of the steel into ingots, because we neither can nor care to sell such steel (in most cases containing silicon and manganese) as second quality, to be used for rolling or forging.

* From a paper presented before the American Institute of Mining Engineers.

† The products of combustion leave our best furnace regenerators at only about 200° C.

It may be said that we make only three kinds of open hearth steel:

1. The softest steel, containing 0.15 per cent. or less of carbon;
2. Tool steel, containing 0.45 per cent. or more of carbon; and
3. Steel castings.

Steel containing between 0.20 and 0.40 per cent. of carbon is seldom made, except at works which manufacture heavy plates. Of these, however, we export a considerable quantity, chiefly to England, Finland, Russia and Denmark.

1. *Soft Steel.*—In making the softest steel, great care is taken to select pig iron as free from sulphur as possible. The sulphur is under no circumstances allowed to exceed 0.015 per cent., if the best quality is required. It is also of importance that the scrap to be used shall be as perfectly free from rust as possible, for which reason many works clean the finer scrap in a rotating apparatus. The rust contains in most cases a considerable amount of sulphur taken up from the coal smoke of factory chimneys.

The pig iron and the scrap are charged at the same time into the furnace, and after the mixture has been melted about three-quarters of an hour the charging of ore is commenced. This ore is always of the richest kind (preferably not less than 64 per cent. of iron) and with gangue of quartz for the acid and talc or lime for the basic method. It should either be generally nearly free from sulphur, or it must be roasted in calcining furnaces before use. Whatever sulphur it contains will be taken up by the iron, even in the basic open hearth process. For the same reason the lime used in the basic process must be free from sulphur. This, however, is not a difficult requirement in our country, which abounds in the purest limestone.

The main thing in the making of the toughest Swedish soft open hearth metal is that the percentage of sulphur and oxygen in the metal at the end of the melt shall be so small that, if possible, no ferromanganese need be mixed with it, or, at the most, only a few tenths of 1 per cent.

For many purposes, for instance in telegraph wire and horseshoe nails, it is necessary that no manganese shall be found in the metal, if it is to give satisfaction to customers; and we have, as the rule for all our products, "as little manganese as the requirements regarding red shortness will permit."

The works which can use gas made entirely from wood are more favorably situated as to sulphur than those which have to use partly or wholly coal; for although in most cases when coal is employed we use a considerable amount of lime in the producers to absorb the sulphur, nevertheless this gas does, as, of course, the wood gas does not, give some sulphur to the melting iron. In using coal gas, therefore, we cannot avoid the addition of from one fourth to one-half of 1 per cent. of manganese; nor do we get absolutely first-class steel.

It is also of importance that the proper temperature shall be maintained during the whole heat. If the melter, at any time during the melt, lets the charge become what we call "cold," the metal will become red short; and this defect follows to the end in spite of later raising of temperature and necessitates a greater addition of manganese. One-fourth of 1 per cent. of manganese decreases the toughness of the steel more than an increase of phosphorus from 0.020 up to 0.045 per cent., which latter is the highest phosphorus percent-

age in first-class soft Swedish open hearth steel. On the other hand, as we do not want to have silicon in our soft open hearth steel, the furnace must not be so hot that the bath will take up silicon from the sides (in the acid furnace). It must be kept so that the ingots shall show some blow holes, but free from oxide coating and placed a considerable distance from the surface, preferably in a ring around an absolutely solid core. The blow holes, however, must not be too numerous or too close together, because if the ingot is rolled in a mill with Gothic or triangular grooves, it may happen that the material between the blow holes is so much crushed in rolling as to make a more brittle steel than otherwise would result.

After J. A. Brinell published his investigations on the influence of heat upon the texture of soft steel,* we commenced at some works to investigate whether the quality of the steel was the same, whether the ingots were left to cool off entirely before being heated for rolling, or were rolled with their initial heat—that is, were only partly cool before they were placed in heating furnace or soaking pit, and then rolled. For this purpose, we permitted every alternate ingot of the cast to be entirely cooled, and the remainder to go warm to the heating furnaces or the soaking pits. Tests of the plates after rolling showed, as we had feared, that the steel possessed less ductility when it had not been entirely cooled and reheated before rolling. We think, therefore, that the use of Gjers soaking pits is not advantageous for steel which is to be finished at one operation, or which is not, in subsequent treatment, to be raised to bright red heat at least, as for instance ship and boiler plates, material for railroads and bridges, and plates for cold cut horseshoe nails, &c.

Again, if the ingots are to be rolled to blooms or billets, which are allowed to cool before they are further worked, it makes no difference whether they are put in the soaking pit hot, or cooled off and then reheated. The difference in ductility, however, is only of importance where strictly first-class steel is wanted.

2. *Tool Steel.*—For the manufacture of hard, first-class tool steel pig iron as low as possible in phosphorus is, of course, required, and is made from our most non-phosphoric ores, with the use in the blast furnace of charcoal nearly free from phosphorus. Tests made by Prof. R. Akerman† have shown that the charcoals delivered from the saw mills in Norrland, and made of wood from which the bark has been taken off before it is floated down the rivers, are those most free from phosphorus. If such charcoals cannot be had cheaply enough, we use, following the same authority, local pine charcoals, avoiding the more phosphoric charcoals made from other kinds of wood.

In hard steel we prefer to keep phosphorus under 0.03 per cent., and call no steel first class which has 0.035 per cent. or more. Our best sorts contain 0.022 per cent. and less. The sulphur in the pig iron has not quite as much influence on this steel as it has on the soft steel, because the effect of manganese on the toughness is not as noticeable with the higher percentage of carbon, and therefore more manganese can be added; but the pig iron and steel are not allowed to contain more than 0.02 per cent. of sulphur—if, indeed, even this does not require too great a percentage of manganese. This is not.

* See *Jernkontorets Annaler*, 1885.

† See *Jernkontorets Annaler*, 1888.

a very difficult condition; for with the careful roasting of the ores, which we always perform at the blast furnaces, and with our sulphur-free fluxes, it very seldom happens that the percentage of sulphur in the pig iron is higher than the figure given above.

The steel melting is so conducted that a good steady heat is kept in the furnace during the process, in order to get the steel, if possible, entirely free from gas at the time of tapping, without too high a percentage of silicon; that is to say, so that the ingots may be solid and free from blow holes, without too much tendency to pipe. If the steel is coming from the furnace too hot, so that piping is to be feared, it is either kept long enough in the ladle to sink to the proper temperature, or the so called De Laval heat rings are used. These are iron rings lined with fire proof material heated to very high temperature, which are placed on top of the molds, and, in casting, are filled with steel, which remains melted in them, and sinks until the ingot below the ring is entirely solidified.

Probably the danger most difficult to avoid in the making of hard steel is getting it too hot, which renders it liable to surface blow holes. We have found, however, that such blow holes are formed only when the melter, at some time during the process, has let the furnace become so cold that the molten mass has taken up too much gas and afterward has attempted to repair this fault by forcing the temperature at the end of the heat. Under proper discipline the tapping of such steel has, therefore, become more and more rare. It is certain, however, as was shown at the World's Fair at Chicago, that we pay more attention to this matter than do the steel makers of other nations; for among the steel ingots exhibited from other countries such faults, and especially pipes, were common. While we are not able to sell any open hearth ingots to England if they have "pipes" or surface blow holes, most of the small crucible ingots, even, exhibited from England had such features.

3. *Steel Castings.*—In the manufacture of steel for castings we had at the outset many difficulties to overcome, because our furnaces were not suited to the business. They were made very shallow, in order to permit the pig and ore process to be operated with rapidity; that is, the furnace was very long and wide in proportion to the size of the charge. This causes, of course, in the making of steel for castings, too quick heats, with too much liability of the metal to take up a large amount of gases, and also, after the addition of ferrosilicon, too much oxidation of the silicon before it has had time to be dissolved in the bath.

At the steel casting works, all of which make soft steel also, we have, therefore, to select a middle course, and to increase the depth of the hearth (thus extending the duration of the heat), although we cannot increase it enough to get the ideal of a furnace for steel castings, because the hearth would then be entirely unfit for the production of soft steel. It follows also that to make steel castings of perfect quality we have to maintain a very high temperature in the furnace during the melting—that is to say, so high that the metal never becomes free from silicon, whereby the absorption of gas is resisted. For this reason the furnaces are much more severely strained in this manufacture than in making steel to be rolled, and they do not last half as long.

Another result is that we almost always have to tap the steel a little too hot, although we possess a protection against overheating in the charging of the relatively cold ferrosilicon, near the end of the operation. This excess of heat, however, is of use in the manufacture of small castings, and for large ones we can always let the steel stand and cool in the ladle. In casting small pieces it is kept hot enough to be tapped from the big ladle into crucibles or hand ladles, and from these into the molds, whereby a finer surface is obtained, because the metal is not poured in such a heavy stream as to detach loose particles from the surface of the mold.

The main point in the production of steel castings is, and will always be, that the molds shall be made of proper material. We use for this purpose partly a kind of red sandstone of a very suitable coarse grain, and partly the purest, preferably amorphous, quartzite, containing 99 per cent. or more of silica. Both of these are ground to the right degree of fineness. It is very important that the material shall be neither so fine as to prevent steam and gases from passing through it, nor, on the other hand, so coarse that the steel can press into the pores, which would give a rough surface to the castings.

Molasses, a solution of carpenters' glue, beer, wheat flour, or Dutch clay, is used to bind the material together. For facing, we use either the finest quartz dust, or (as at most works) siliceous earth (*kieselguhr*), which, if pure, is beyond comparison best. At the beginning, we bought such material in England, under the name of "Rosmedium," and possibly this does well for steel cast so cold as is the practice with the more phosphoric and more fusible English metal; but with our steel the facing burned fast to the castings and gave them a bad looking surface. We have now succeeded in getting a German *kieselguhr* which is unusually pure and good, and when stirred into a solution of carpenters' glue, gives the most handsome surface.

The molds should be well vented and dried, at least for small castings, until every trace of moisture has disappeared. Heavy castings are not so sensitive; they will always drive the moisture out of the mold mass, and it takes a very careless molder or melter to make them unsound.

In order to save the expense of maintaining so high a temperature during the melt, we have practiced for some years past in the manufacture of goods of minor importance, such as common trade castings, the addition of about 0.02 per cent. of aluminum at tapping, but, believing that we have found the aluminum to decrease the tensile strength of the metal, we do not use it when the strongest product is desired. As may be easily seen if a steel ingot from a charge containing aluminum is broken in two, this element gives the steel a tendency to arrange itself in large crystal faces from the outside toward the center. By such an inspection it is easy to discover in an ingot or large casting whether even a small amount of aluminum was used in the manufacture or not. These crystal faces are also the reason that it is much easier to break cold by blows a steel ingot containing aluminum than one free from this metal.

It is indeed true, this crystalline structure is to some extent destroyed by annealing the castings; but probably the destruction is not complete, and we cannot permit our product to have the least tendency to a crystallization which

would impair its toughness, because it is subjected to the severest tests. For instance, it must successfully compete for guns and armor piercing projectiles with the forged steel of other countries, although our products are not forged at all, but, after casting, only annealed and tempered.

I have recently seen in *The Iron Age* that a leading authority in this field says he has found that from 0.85 to 0.95 per cent. of manganese has no bad effect. As I have not had the opportunity to test foreign steel castings, I will not question this assertion so far as they are concerned; but tests for ductility, and especially for drop tests at low temperature, made of our open hearth castings, have shown that they possess most toughness where the silicon is 0.25 per cent. or less, and the percentage of manganese is as small as possible, and that the quality of the steel will be the very best when the desired high tensile strength has been obtained by increased percentage of carbon, or, still better, by the addition of a sufficient amount of nickel or chromium, or often both these metals combined. As I have said, we regard manganese in steel castings and tool steel as a necessary evil, and in the softest steel as an unnecessary evil; I expect, of course, the so-called manganese steel with high percentage of manganese, which we have indeed tried, but without much satisfaction.

At the Finspong gun works, we have now commenced to make even plates for armor towers by direct casting, without any forging afterward; and although this has been done as yet to a small extent only, it is clearly shown that the right way to make armor for fortifications is, without doubt, to cast the plates and then only heat and temper them after machining, thus omitting entirely the forging or rolling. Only a small increase in thickness is required to make them equal to rolled plates; and they are so much cheaper to make that they can be cast to great advantage a good deal heavier than any of our present rolling mills can make their plates. To this may be added, that armor plates made in this way can be cast with strengthening ribs, and in shapes impossible for rolled plates. The one thing necessary is that metallurgical engineers and contractors unite their experience to perfect the details of practice.

I deem it unnecessary to state the theory of the open hearth process as we operate it, since H. H. Campbell and Russell W. Davenport have already, in 1893, so admirably explained it on the basis of American practice, and most of what I could say would only repeat nearly what they have brought forward. I will only add, therefore, that in the past few years we have been going over to the basic process, which in my opinion will, in all probability, gain a still stronger foothold among us. At the same time, I wish to say most emphatically that we have not at all changed to this method in order to get a better product than we were making already; for I hardly think we can do that. Our sole reason for the change is the saving of time and fuel. At a number of our basic furnaces magnesite linings, and at others dolomite linings, are used, and we believe, as do the engineers at the basic works in America, that the former are the best, but in many places we prefer the dolomite, for the same reason as they do in America—namely, because we have a good deal of it in our own country and therefore can get it cheap, while

the magnesite must be imported from Germany.

The operation of the basic process is the same here as in America, except that we, of course, do not have to tap any phosphoric slag toward the end of the process, owing to the low percentage of phosphorus in our material. But since, even in the basic furnace, we try to use as much pig iron and as little scrap as possible, we have to add about as much lime, to counteract the silicon of the pig iron. The greatest difficulty we have had to overcome in the basic method has been to make solid hard steel and steel castings without adding aluminum; but this has been overcome by the addition of ferrosilicon and ferromanganese, previously melted in a crucible, to the steel in the ladle.

A peculiarity in both our acid and our basic open hearth process is, perhaps, that we prefer not to recarburize. We tap the charge when the forge test and the carbon test show the required degree of hardness; and if in filling a very pressing order the melter should have let the steel go too low in carbon so that we are forced to recarburize, we do this always by adding a good deal more pig iron than is needed to supply the carbon, and letting the charge boil a few hours longer in order to get an entirely homogeneous product. It was common before 1880 to recarburize, if necessary, by adding just as much pig iron as was needed to bring the carbon to the right degree, but in the beginning of that year a works, which had delivered plates containing 0.20 per cent. carbon to a steel bucket factory, received complaints that in the shaping small particles of adamantite hardness were pressed out of the soft plate, and these were found to be white pig iron from the recarburizing pig. Microscopic examination of the fracture surfaces of tensile test pieces has shown that even the ferrosilicon and ferromanganese, added toward the end of the heat, partly remain in granular form if sufficient time has not elapsed between the addition and the casting.

According to the reports of the Royal Department of Commerce, the production of open hearth steel in Sweden was in 1886, at 13 works, 22,460 metric tons, and in 1892, at 22 works, 76,556 metric tons. This is (in proportion to the size of our country) a rapid growth, both in number of works and in aggregate product, the former having been nearly doubled and the latter more than trebled in six years. At the present time there are two new works under construction with furnaces of 10 tons capacity.

Joseph D. Weeks estimates the total production of petroleum in the world last year at about 84,330,809 barrels. Of this the United States produced 48,412,666, or 57 per cent.; Russia produced 33,355,669 barrels, or nearly 40 per cent.; Austria-Hungary is third in point of production, while the production of Canada in 1893 was 798,406 barrels, or a little less than nine-tenths of 1 per cent.

An English newspaper reports that some large contracts have just been given out by the authorities of the Russian Southwestern Railway for a year's supply of rails and other rail accessories. Although the lowest tenders received were those of German and Belgian firms, the Russian firms were asked to retender, the same facilities not being given to the foreign firms,

the result being that the contract has been divided between the Putilow Works, Lilpop, Rau & Lowenstein of Warsaw, and the Iron & Steel Company of Ekaterinoslav.

Material Handled to Obtain Iron Ores.

In collecting the statistics of the production of iron ore for 1893 for the volume "Mineral Resources of the United States," just issued by the Geological Survey, John Birkinbine of Philadelphia made an endeavor to obtain approximate figures as to the total amount of material moved in winning iron ore. Generally speaking, the brown hematites require the removal of the largest amount of material, followed by the carbonate, red hematite and magnetite ores in the order named. It was found impossible to obtain complete figures, as at a number of the mines no records are kept, at others (brown hematite) only the record of the number of tons passing through the washers was preserved, the overtop or stripping where the ore was won by open cut not being included, except where some of this overtop went into the washers; but the range of quantities furnished by various reporters are tabulated below. The quantity of material handled in some of the States is due to opening new mines, dead work, mining lean magnetite or red hematite, which was concentrated, &c. Most of the brown hematite workings are open cut, and a considerable overtop must be removed until the ore body proper is reached, which will yield 1 ton of ore from 2 to 8 tons of material put through the washer, although there are exceptional cases where still greater averages are handled.

The carbonate ores require roasting to raise the iron contents by removing the carbonic acid, but as this class of ore is generally mined underground there is a smaller quantity of refuse material, and in most localities about 2 tons of material handled per long ton of ore produced may be taken as an average, although, as will be seen in the table, sometimes 6 or more tons of material must be removed and treated to produce a ton of merchantable ore of this class.

The red hematite and magnetite ores are mined chiefly underground, and with the exception of some lean magnetite which requires concentration, are ready for shipment as they come from the mine, after the rock has been sorted out and the larger pieces of ore crushed to a size appropriate for furnace use.

The following tables will show the variations of the amount of material treated from such records as were obtainable for each variety of ore:

Material Moved in Mining Brown Hematite.

States.	Amount of material treated per ton of merchantable ore.
	Tons.
Alabama.....	1½ to 9
Colorado.....	1½ to 3½
Connecticut.....	2½
Georgia.....	2 to 5
Kentucky.....	3 to 4
New York.....	1.06 to 5.6
Pennsylvania.....	1½ to 10
Tennessee.....	1½ to 3.8
Utah.....	3
Virginia.....	11 to 10
Wisconsin.....	2.2

Material Moved in Mining Red Hematite.

Alabama.....	1.7-7. to 11-5.
Georgia.....	2. to 2.8
Michigan.....	1. to 4½
Minnesota.....	1.08 to 2.
Missouri.....	1 to 3
Montana.....	1.08
Pennsylvania.....	1 to 6.
Tennessee.....	1.05
Utah.....	1½
Wisconsin.....	1.06 to 1.2.

Material Moved in Mining Carbonate Iron Ores.

Colorado.....	1.4-7.
Kentucky.....	4
Maryland.....	*10 to 18.
New York.....	2
Ohio.....	1½ to 6.
Pennsylvania.....	4
Tennessee.....	1.8

* This is for the winning of kidney or pot ore and practically includes stripping.

Material Moved in Mining Magnetite.

Montana.....	1
New Jersey.....	1.12 to 3
New York.....	1.01 to 2.34
North Carolina.....	1.58
Pennsylvania.....	1 to 1½
Texas.....	8½
Virginia.....	2.8

Duluth News.

Mining matters on the several Lake Superior ranges continue in fairly satisfactory progress, and ore is being sent forward with much rapidity. On the Gogebic the strike situation is far from settlement, though the mines are all at work. The Norrie group are handled only at the point of the bayonet, so to speak, the strikers attacking unattended non-union men, and delaying the action of the mines seriously. It is quite probable there will have to be an open conflict before the affair is settled. The Colby group is satisfactorily at work. On the Menominee and Marquette there are no changes of moment, and no likelihood of labor troubles. The Vermillion and Mesaba are working steadily, and several important new deals and purchases are reported from the latter. The Minnesota Iron Company seem to be the only concern that are investing in Mesaba properties at present, and they are getting a strong foothold on the range. The past week they gave notice of their intention to close the purchase of a mine in township 57-17, which they optioned a few weeks ago for \$200,000, and since then they have taken an option on a mine adjoining the Oliver, one of the so-called "Humphreys properties," where are 23 acres of ore uncovered, the option being for a 25-cent lease and 100,000 tons minimum output annually. This gives this company five large mines and two excellent prospects on the new range, all outside their enormous holdings on the Vermillion. Their workings on the latter are showing up a higher grade of ore than ever before, assays from one of their deep shafts showing large ore bodies running 68 per cent. and better in metallic iron.

Ore shipments from Duluth and the sub port of Two Harbors have been to date about 1,250,000 tons, of which each of the two Minnesota ranges has contributed about half. The Duluth & Iron Range road will probably ship for the season over 1,600,000 tons, while the Duluth, Missabe & Northern will handle over 1,200,000 tons, or for the two ranges twice what they shipped

last year. Shipments of ore from the other Lake Superior ports are to this week from Ashland 725,000 tons, Marquette 450,000 tons. Escanaba has sent but about 750,000 tons to date.

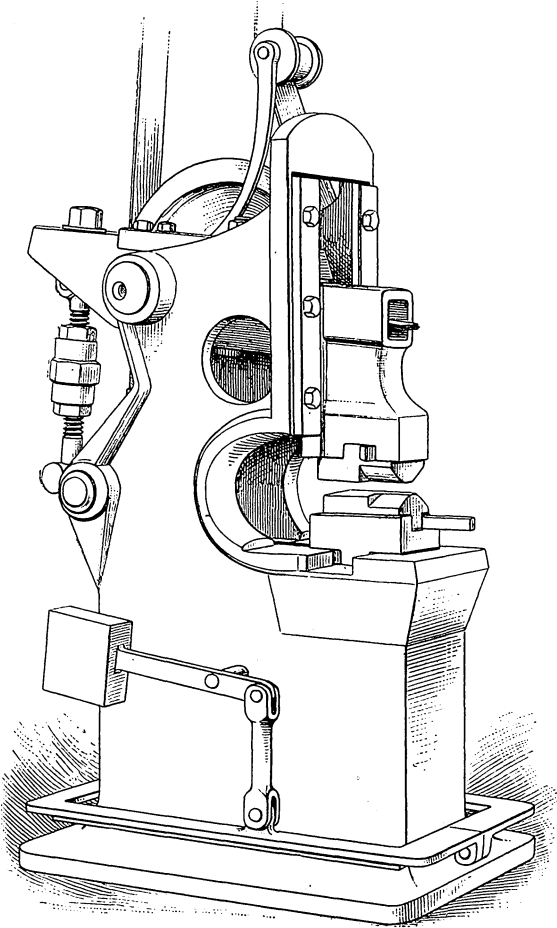
A very large mine has been found on lands belonging to A. E. Humphreys of this city and W. C. Yawkey of Detroit. It is in section 5, town 58-17, and may be classed as belonging to the Virginia group. Mr. Humphreys has 12 exploration crews at work, and believes he has as large a mine as any on the range, though this is a decidedly generous assertion. The ore is said to be of a good quality, much like that of the Oliver, and lies so near the surface that part of it can be mined by the stripping process. This find em-

phasizes one thing strongly, and that is that the Mesaba ore is not yet all discovered, by a long ways; the ground where it was found has been traveled over time after time in the past two years.

of the strike now appears to be the demand for an eight-hour day, which the companies will not concede.

Laird & Sweeney Power Hammer.

In the power hammer illustrated the main frame is in one piece, its upper portion being reversed to receive the working parts. It can be operated at the front or either side, the counter-balanced treadle connecting with the belt tightening pulley providing an easy control for light or heavy blows. It always stops with the head raised, and is furnished with a brake, by means of which it may be stopped instantly. The spring is composed of parallel plates of



LAIRD & SWEENEY POWER HAMMER.

crucible cast steel, $\frac{1}{8}$ inch thick, so that it can be made as stiff or as flexible as may be required for any desired speed by adding or taking from the number of plates. The length of stroke can be changed without changing the position of the head in relation to the dies. This is accomplished by means of the turn buckle shown at the back of the machine. The lower end of the screw unites with the other end of a rocking arm, whose inner end is connected with the crank of the driving shaft. The upper end of the screw is connected with the helve. The inner end of the spring is bolted to the helve, while its outer end passes through an opening in the hammer head, in which it is free to play as the hammer moves up and down in the guides. Since all the working parts are practically balanced, very little power is required to run the hammer. The machine requires no special foundation when operated at ordinary speed.

A test made of a 75-pound hammer provided with a 142-pound head, and run at 200 revolutions per minute, showed very little vibration and no movement on the floor, to which it was not bolted. This hammer is made by the Laird & Sweeney Mfg. Company of St. Johnsbury, Vt.

Additional Tin Plate Brands.

The following names of American tin and terne plates, made specially for Hibberd, Spencer, Bartlett & Co. of Chicago, were received too late for inclusion under the head of "Dealers' Special Brands" in the American tin plate brand list published recently:

BRIGHT CHARCOAL PLATES.

Pawnee. (Alloway grade.)

BRIGHT COKE PLATES.

Old Hundred. (100 pounds, J. B. grade.)

R. W. B. (Full weight, J. B. grade.)

TERNE PLATES.

Iroquois. (206 to 216 pounds, machine squared.)

Niagara. (Full weight, machine squared.)

Toluca. (Full weight, stamped and resquared.)

Hibberd, Spencer, Bartlett & Co. inform us that these American plates have established for themselves quite a reputation in the West, and are in very active demand at the present time.

An Iron Project in Utah.

Articles of incorporation have been filed with the county clerk for the Ogden Iron Mining & Manufacturing Company of Ogden, Utah.

The company own nine iron claims, all in Weber mining district.

The incorporators are Alber Allen, Joseph Tyrrell, John Junker, C. S. Pulver, S. L. Ives, S. H. Head, Geo. F. Seager, C. A. Bedford, O. A. Kennedy, Maroni Poulter, L. E. Seager, James Wotherspoon, L. E. Bedford, J. C. Nye, E. G. Williams, E. F. Bratz, H. S. Seager, A. J. Weber and Geo. H. Burgitt, all of Ogden, Utah.

The officers of the company until the next regular meeting of stockholders in December are: Maroni Poulter, president; A. F. Bratz, vice-president; O. A. Kennedy, secretary, and C. S. Pulver, treasurer, and with John Junker, Joseph Tyrrell and C. A. Bedford constitute the board of directors.

The organization of this company is the result of an effort to consolidate all the desirable iron properties in the vicinity of Ogden under one management, for the purpose of development in the hope that such action may lead to starting up the old iron works which were once successfully operated in that city. By a united effort the owners, over 20 in number, of these properties hope to do what singly they could not expect to accomplish.

Two Northern Ohio inventors have, it is announced, just completed the plans of a new submarine vessel, designed primarily for work on sunken ships. They claim that the boat can be submerged at a moment's notice, and that it can store sufficient air to enable its occupants to work under water without serious inconvenience for 12 to 24 hours.

Press Working of Sheet Metals.—IV.

BY OBERLIN SMITH.

Cutting Processes.

Having more or less accurately formulated the ideas of writer and reader regarding tools and materials, we will now deal with actual processes, showing in such diagrams as may be necessary only conventional forms for shear blades, dies, &c., and omitting as far as possible, for the sake of simplicity, pictures of the presses themselves or of the methods of fastening dies thereto. The details treated of will generally require only certain views of the working surfaces of the respective dies and of the materials worked therein. The

Shearing.

The next and most usual process for cutting materials embodies the principle of shearing, shown in its most primitive form in Fig. 44, where a certain part of the material is pushed away from a plane represented by one of its surfaces, as *a a*, Fig. 44, into another plane parallel thereto, by being slid past the other part of the material, which remains in its normal position. This sliding of certain particles or molecules of metal past certain other ones constitutes the stress known in engineering by the general term of "shear," and is governed by well-known laws as to the resistance of the material itself.

In Fig. 45 is shown, in end view, a more usual form of shear blades, the cutting edges being made at an angle of about 75° between their two limiting surfaces, instead of 90° as in Fig. 44.

from its original flat condition as at *M*. This inclination of one blade to the other is usually somewhere between 2° and 10° . If the angle is too great the tendency of the work is, obviously, to slide lengthwise of the blades, or toward the left in Fig. 47. The greater the angle the easier the work is done by the machine and the more the sheet is distorted, and *vice versa*.

Punching.

In Fig. 48 is shown in vertical axial section (which, by the way, is the kind of view given in most of the previous pictures where circular work has been represented, and which will be usually understood hereafter unless otherwise specified) a pair of ordinary round cutting dies, without dip, both working surfaces lying in planes parallel to each other. It is evident that such a pair of dies are in principle simply a pair of

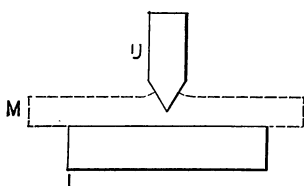


Fig. 43.

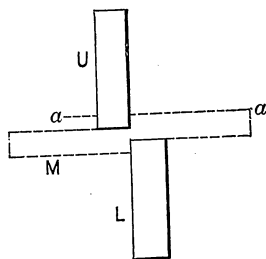


Fig. 44.



Fig. 45.

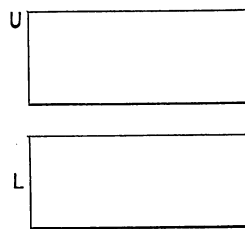


Fig. 46.

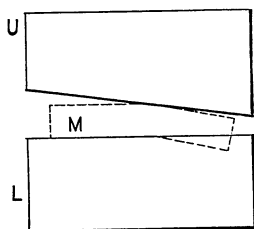


Fig. 47.

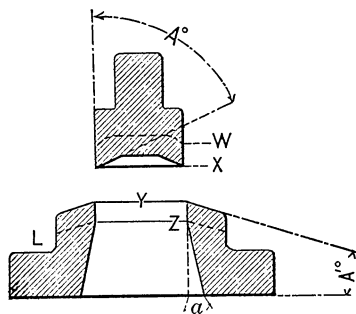


Fig. 48.

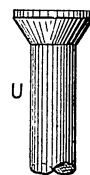


Fig. 49.

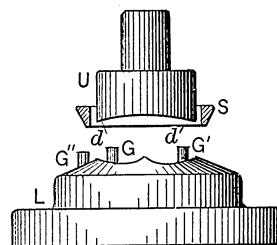


Fig. 50.

PRESS WORKING OF SHEET METALS.

letters *U* and *L* will represent upper and lower dies respectively in their conventional sense, although it must be remembered that the respective positions of these are, in practice, sometimes reversed, or in some cases turned at right angles or at some other angle to their usual vertical position—as in horizontal shearing machines, inclined presses, &c. The metal or other material when shown between the dies will usually be represented by dotted lines and will be marked *M*.

Chiseling.

If we analyze cutting processes as performed in presses we find a most primitive idea to be that of the chisel, as shown in Fig. 43. This is in a certain sense a form of coining or forcing the tool bodily into the metal. Practically it is an application of the wedge, which was probably carried out in antediluvian times, when the primeval metal worker found a particularly sharp edged stone and pressed it hard down upon his piece of copper or lead that he might separate it and make the one twain.

In Fig. 46 is shown a face view of the blades in Fig. 45, the same being made parallel, so that all points along their cutting edges will come into contact with the metal at the same time. This form is best where the metal must not be twisted or otherwise disturbed, and is good enough in any case where it is quite narrow in comparison with its thickness, as with square bars. With such proportions it obviously is not practicable to much lessen the pressure required to do the cutting by dividing it up and extending it over a longer time. Such an extension of time and lessening of the pressure at any particular moment may sometimes be obtained, however, by making one of the blades, like the upper blade in Fig. 47, with an inclination of the edge, commonly known as "shear." This evidently is useful only where the width of metal cut is considerable. It is obvious that in such case one edge of the piece of bar or sheet metal is pushed down by the upper blade and depressed in advance of the other edge, thus producing a bending action across the sheet which distorts it more or less

shear blades, like Fig. 46, bent around into a circle, and that the same principles involved in ordinary shearing hold good. This statement may be somewhat modified where the diameter of the blank (this term "blank" meaning in general any shaped flat piece cut from a sheet) is quite small in comparison with its thickness, as for instance in punching boiler plate, &c. In such cases a little more force must be required to do the shearing, on account of the blank being tightly confined in the hole from which it is pushed; while in doing the same amount of shearing in a straight line the piece cut off usually falls freely away without friction.

In Fig. 49 is shown an upper die or punch, such as is often used for boiler work, &c., with its lower end made in a spiral form, instead of lying in a plane normal to its axis. Various experiments with such punches have shown them to require considerably less force to drive them through than in the case of the ordinary flat bottomed ones. In Fig. 50 the same principle of dip is shown in the upper die *U* with its two high points *d d'*. These strike the

metal first, the bottom of this die being scooped out in general as if it had been held against a cylindrical grindstone. For large diameters this is much better than a single high point, as in Fig. 49, because the pressure upon the press ram is balanced, whereas with one point striking the metal first there is a tipping action which tends to spring the ram and upper part of the press frame out of a vertical position, and consequently to slide the upper die sidewise over the lower one. The lower die L in Fig. 50 is also shown dipped, having in this case four high points. In practice, however, one die is usually made flat, all of the dip being put upon the other. Which die should be flat depends upon the nature of the work. With a thin material, such as tin plate, and with diameters, say, not

In Fig. 52 is shown a typical form of combination die of the kind referred to, which will produce perforated work. As shown, it is arranged for cutting simply a circular ring or washer, M. Such ring, of course, remains upon top of the lower die L, the small blank cut from it dropping through as usual. An inspection of the picture will show that L consists of a male die at the outside and a female die in the center, while U consists of a female die outside and a male die in the center. The rings K K' are used as knockouts or strippers and are usually driven by springs, the function of K being to drive the finished ring out of the upper die and of K' to lift the surrounding remainder of the sheet from the lower die. The work is, of course, shoved out sidewise or backward, either by means of the sheet it-

ones between, as for instance in Fig. 53, where those marked A are thus punched first. This diagram represents a sheet of tin plate from which six fruit can tops have been made in gang combination dies. The lower die is shown in top view in Fig. 54. After the first stroke the sheet is either turned around or turned over so that at the second stroke all those holes marked B will be punched, and so on. In feeding a long strip of metal by this system (see Fig. 55) there is no lost time except at the ends of the strip, where, for instance, in the case shown, only two holes, A A, could be punched at the first stroke, two whole ones and three halves, B B, &c., at the second stroke, but the five complete ones, C C, &c., as located in the lower die, Fig. 56, at the third and subsequent strokes.

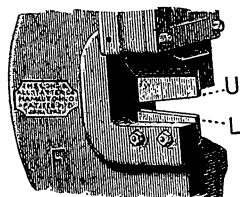


Fig. 51.

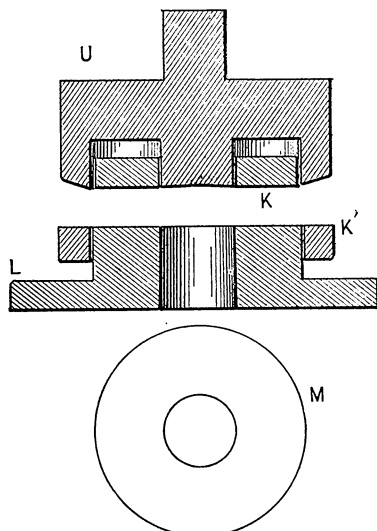


Fig. 52.

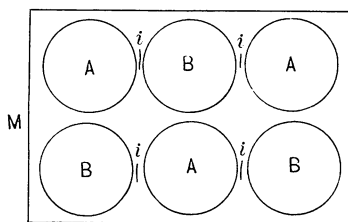


Fig. 53.

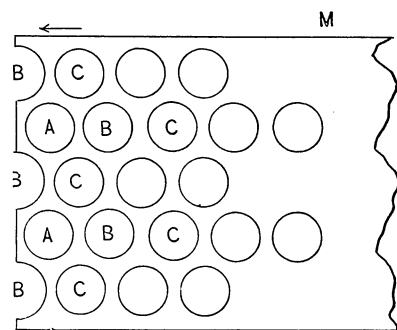


Fig. 55.

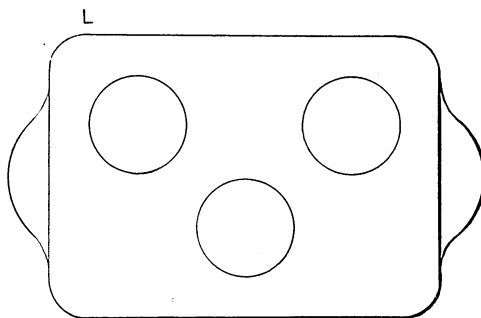


Fig. 54.

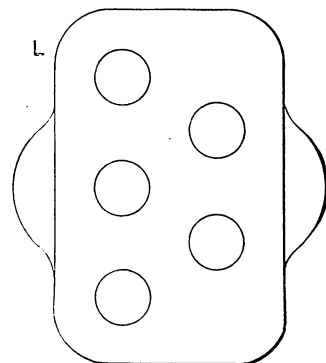


Fig. 56.

PRESS WORKING OF SHEET METALS.

over 2 inches, this point is of little consequence, as both the blank and the sheet outside of it, if sprung out of flat while the die is going through, will readily be restored to a flat condition by their own elasticity. If, however, the metal is thick and rather non-elastic and the diameter small, it is evident that an upper die scooped out, as in Fig. 50, would bend the blank, perhaps beyond its elastic limit. In such cases, therefore, the upper die should be perfectly flat, that is, if no damage will be done to the sheet outside by its being bent as it rests on the dipped lower die.

In Fig. 51 is shown a part of the frame of a press with a pair of plain shear blades mounted directly upon bed and ram.

Combination Cutting Dies.

Another general method of producing completed pieces at a single operation is by combination cutting dies, wherein one or more male dies are usually set inside of a female die, and *vice versa*.

self or by means of gravity, when the press happens to be in an inclined position. Such dies as these are largely used for cutting armature disks and such like accurate work, oftentimes being built with a large number of teeth or notches around the outer edge, which obviously makes them very expensive. They are, however, usually built up in sections, so that if one piece needs repairing or renewing the whole die need not be thrown away.

Recurring to ordinary gang punching dies for producing work, or rather scrap, of the general character shown in Fig. 53, it is evident that in some cases the holes might be so near together that the little isthmuses, as we may call them, *i, i, i*, &c., would be too narrow (so as to avoid waste of metal) in the female die to secure the requisite strength for it to hold together. The remedy in such case is to set the gang of punches and corresponding holes in the lower die that certain alternating holes may be punched in the metal, omitting the

Cutting Dies.

In general, some of the important points desirable to secure in cutting dies are first rate material of proper hardness; great rigidity against distortion by springiness, especially in lateral directions, and durability by having ample length of bearing surfaces, as from W to X and Y to Z, in Fig. 48. Each die between these points should be perfectly parallel, so that when sharpened by grinding off the top surface of L and the bottom surface of U they will still fit each other as tightly as at first, or as nearly so as is consistent with what their cylindrical or prismatic surfaces, as the case may be, which slide against each other, have actually worn away. It is, therefore, very bad practice to make the hole in a round lower die conical all the way through and to make the upper die conical, decreasing from the bottom upward.

Hardness of Dies.

While in the case of punching and shearing thick metals the upper and

lower dies or shear blades, as the case may be, are both made hard, there is a large variety of work where one of the dies is made moderately soft, the other one being as hard as possible consistently with not having the sharp edges crack off in working. Such dies can usually be worked upon all metals no harder than iron or very mild steel which are less than $\frac{1}{8}$ inch thick. The object is that the dies may be quickly and cheaply repaired, as far as maintaining sharp cutting edges is concerned, by hammering up the top or bottom surface, as the case may be, of the soft die, thus spreading out or riveting such die sidewise, making it larger if it be the male and smaller if it be the female. This can often be done without unsettling either of them from the press. After the proper amount of hammering the dies are oiled and forced together, the hard one shaving or

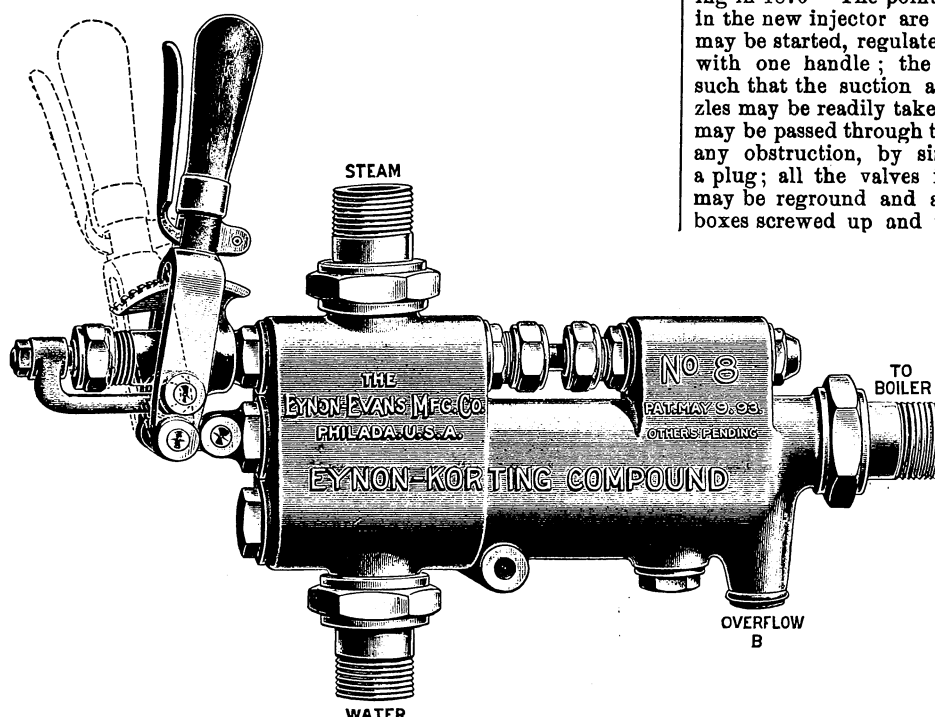
cause such grinding is on the outside where accessible. The reason for such after grinding being necessary is, of course, the warping or shrinking, or both, of the steel, which often happens after hardening to an extent great enough to spoil the accuracy with which the die was originally made. The difficulty of grinding above spoken of obviously does not occur with round and elliptical dies, as the female ones can be ground out inside in ordinary grinding lathes.

The official records of the Bureau of Navigation, Treasury Department, show the following number of vessels to have been built in the United States during the quarter ended June 30, 1894: Atlantic and Gulf: Steel—Steam, 6; gross tons, 8709.35. Iron—Steam, 3; gross tons, 1819.20. Wood—Steam, 39;

under erection a tank blow furnace and flattening oven for the Lawrence Glass Company of New Castle, Pa. They are also building five more patented economical blow furnaces and making the annual repairs and doing other work for the Chambers & McKee Glass Company at Jeannette, Pa.

The Eynon-Korting Compound Injector.

A compound injector has been recently placed on the market by the Eynon Evans Mfg. Company of Philadelphia. It belongs to that class of steam injectors in which two nozzles or a series of nozzles are arranged side by side in such manner that the fluids discharged from the first are returned and delivered through the second, and is more directly an improvement on the double tube injector patented by Korting in 1876. The points of advantage in the new injector are as follows: It may be started, regulated and stopped with one handle; the construction is such that the suction and forcing nozzles may be readily taken out, or a wire may be passed through them to dislodge any obstruction, by simply removing a plug; all the valves in the injector may be reground and all the stuffing boxes screwed up and repacked with-



THE EYNON-KORTING COMPOUND INJECTOR.

broaching off the surplus metal from the soft one, thus leaving them again a good fit, one within the other. It is, of course, necessary that the hard die should in such case have a reasonably sharp edge. In most cases it is best to have it freshly ground.

The vexed question of which die shall be hard, male or female, is not of very much consequence, although many people take it for granted that it should be the female, simply because they have always been accustomed to that method. One good reason exists for this, however, viz., the presence of a hard surface, which will not wear away so fast, over which to slide the sheets, these sometimes being covered with scale, and therefore doing a good deal of grinding on their own account. In some cases, however, where great accuracy of shape and size is required it is difficult to make the female die hard, because of the trouble of grinding it out to exact dimensions after hardening, ordinary grinding machinery not being made for sliding through small holes of irregular shapes. If, on the other hand, the male die is hard it usually can be ground exactly as wanted, be-

gross tons, 5181.52. Sail, 166; gross tons, 9877.45. Pacific: Wood—Steam, 6; gross tons, 1984. Sail, 23; gross tons, 567.86. Great Lakes: Steel—Steam, 6; gross tons, 10,155.84. Wood—Steam, 26; gross tons, 5881.84. Sail, 10; gross tons, 2992.72. Western rivers: Steel, 3; gross tons, 170.17. Wood—Steam, 16; gross tons, 1163.33. Total steam, 105; gross tons, 35,065.25. Total sail, 199; gross tons, 13,438.03. Previous quarter: Total steam, 59; gross tons, 13,739.63. Total sail, 61; gross tons, 7126.19.

The tank furnace built by the S. R. Smythe Company, engineers and contractors, Lewis Block, Pittsburgh, Pa., for the Shenango Glass Company of New Castle, Pa., has just been blown out after a very successful run. It is stated that the tank has worked continuously during the fire without a block being put in or any repairs of any kind being found necessary. The S. R. Smythe Company have received an order for the erection of a new lehr and one more patented economical blow furnace for the Shenango Glass Company. The same firm have

out dismantling or disconnecting the injector from its piping; the number of pieces comprising this type of injector has in this new injector been reduced about 30 per cent. and all the parts are interchangeable, thus simplifying the instrument and lessening the cost of repairs.

In designing the injector the manufacturers state that the objective point was the production of an injector every part of which would be accessible without a removal from the pipe connection. Their success in this direction is demonstrated in the views here shown. Fig. 1 is an exterior view of the injector, the absence of all side rods, eccentrics, cranks and other parts tending to collect dirt and dust being particularly noticeable.

Fig. 2 is a sectional view of the injector and shows the simplicity of its construction, all the valves being operated in a straight line. The suction nozzles 28 and 29 are accessible by the removal of the plug 18, and the forcing nozzles 26 and 27 by removal of the pin 15 and the plug 17. The steam and overflow valves 22, 25 and 33 and the auxiliary check valve 37 are easily re-

moved for regrinding, and the seat of the latter may be removed by unscrewing plug 88. In operation the handle is pulled forward and steam is admitted by valve 25 through an outside passage or belt to the suction steam nozzle 28, producing a vacuum in the suction pipe and causing the water to pass through the auxiliary check 37 and overflow valve 33. When water appears at the overflow the handle is then continuously drawn back causing all the water to pass through the combining tube 27, the speed of the water being accelerated by steam admitted by the valve 22 into the steam forcing nozzle 26. The establishment of a momentum overcomes the pressure on the check valve 35, and the water passes directly through the feed pipe into the

feet long, and will be built for the 20-foot channel, their molded depth being $24\frac{1}{2}$ feet. Their carrying capacity on the present stage of 16 feet will be about 3,000 tons, but when the 20-foot channel shall have been completed they will carry something over 4,000 tons.

The Saving Effected by Automatic Sprinklers.

Edward Atkinson, president of the Boston Manufacturers' Mutual Fire Insurance Company, has in a special circular just issued done some figuring on the amount of money saved by automatic sprinklers, which is very instructive. We quote the document as follows: The standard for protection by auto-

a condition, it becomes expedient to give the facts, which will prove that the large expenditures already made have much more than paid for themselves. These expenditures may have amounted to between \$3,000,000 and \$4,000,000, mainly for sprinklers, but in part for raising the standard of pumps, pipes and hydrants. At that estimate this apparatus already stands free of cost with a cash return to the members of this company, considered as a whole, of at least 50 per cent. in addition. Such is the fact if we deal only with the increased dividends that have been made since these new safeguards were adopted. But in addition to the actual dividends which our members have received in money, concessions in rates of premium have been made, or rates have been maintained low which would otherwise of necessity have been advanced. We have no exact data by which we can actually prove what this element amounts to, but on the closest computation that I can make it is at least equal to the sum of the increase in dividends.

Bearing these statements in mind, attention is called to the following compact statement which is derived from the books of this company only. I will not submit a complete statement in the form of a full account until the end of

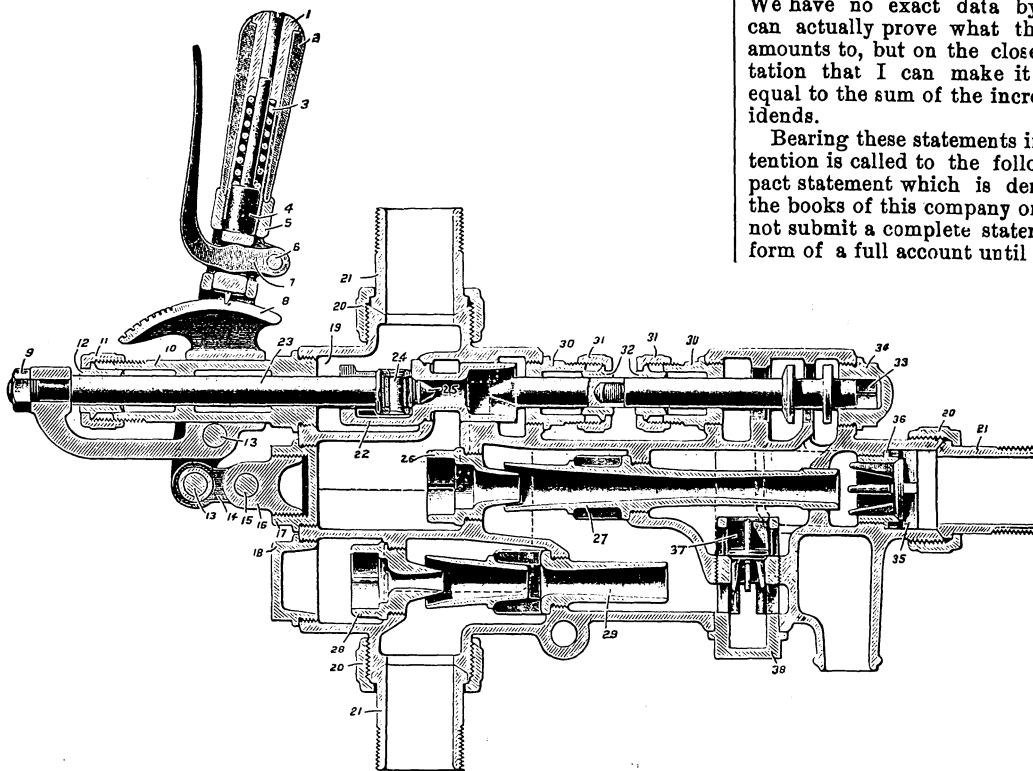


Fig. 2.—Vertical Section.

THE EYNON-KORTING COMPOUND INJECTOR.

boiler. A simple pulling of the handle starts the injector and a reversal regulates it, while a closing of the handle stops it.

The injector may be connected to a boiler or placed on a locomotive in whatever position is most convenient, but it should always be set horizontally. It will fit the pipe connections of the injectors most commonly used in locomotive service.

Captain A. H. McCormick, Lieutenant-Commander J. G. Eaton and Lieutenant Carl Rohrer of the United States Navy have been nominated a board to examine the steel castings made by the Midvale Steel Company of Philadelphia.

Two large steel barges will be constructed by the Chicago Shipbuilding Company, at their yard on the Calumet, for the Minnesota Steamship Company, the coming fall and winter, the boats to be ready for service at the opening of navigation next spring. The barges will be duplicates, will be about 300

feet long, and will be built for the 20-foot channel, their molded depth being $24\frac{1}{2}$ feet. Their carrying capacity on the present stage of 16 feet will be about 3,000 tons, but when the 20-foot channel shall have been completed they will carry something over 4,000 tons.

automatic sprinklers which was established in 1880 has been continued since under urgent pressure, until all the risks insured in this company which seem to require sprinklers at any point are substantially protected up to that standard. It called for sprinklers in all the departments of textile factories in which the stock is worked in a loose condition; in machine shops and other works in departments of an analogous kind. It may not be expedient to raise that standard at the present time as a condition of continuing to insure outstanding risks at present rates; yet so many of the members of this and other senior companies have adopted the suggestion to protect all departments or are doing so, as to make it probable that justice to the majority of members may by and by make it our duty to carry sprinkler protection throughout every part of the mills or works insured by us, as a condition of continuing our insurance upon them.

In order to prove that such a suggestion might even now be rightly made

the current year. It will suffice for the present purpose to give a condensed statement disregarding minute fractions.

In the period which has elapsed since 1880, covering the years 1881 to 1893, inclusive, and five months of the year 1894, this company have issued policies to the amount of \$1,150,000,000. The average rate of premium charged on this work has been a fraction under 83 cents per \$100 insured. The premiums returned on canceled policies would correspond to something less than \$50,000,000 of risks insured for one year. We have therefore carried \$1,100,000,000 for the full term of 12 months each policy. For that service we have received a fraction over \$9,500,000. Our average dividend or return of premium has varied but a fraction from 75 per cent. of this sum. For the last ten years it has been a little in excess of that rate.

Assuming that we were now to re-insure all risks for the unexpired term and to settle up all accounts, the cost of insurance to all our members during

this entire period would be almost exactly 20 cents per \$100 carried for 12 months. That cost would consist of losses, 17 cents; taxes $\frac{1}{2}$ cent, and expenses not covered by the revenue derived from investment of premiums $2\frac{1}{2}$ cents.

The exact loss on the risks carried has been $16\frac{2}{3}$ cents on each \$100. On reviewing the fires by which we have been subjected to a loss in this company exceeding \$25,000, I find that they number 17; the amount of the loss on these 17 specific fires being \$1,110,000, or a little over \$65,000 each.

Upon investigating these specific fires I find that eight occurred in establishments which had not been brought to the present standard of automatic sprinklers at the time of the fires. The total loss in these eight fires was \$550,000, or one half the whole sum lost on 17. We may be wholly justified by our experience in assuming that had these eight risks been protected at the present standard our losses upon them would not have exceeded \$50,000 and would have been \$500,000 less than they were. That would have reduced the total loss on all claims to 13 cents per \$100 insured.

In this period we also made the heaviest loss to which we were ever subjected and which occurred under the most unforeseen conditions in one of the few risks ever marked "excellent" at all points by our inspectors; in a mill devoted exclusively to weaving, in two parts, adequately separated, as we believed, by two party walls parapeted above the roof, between which was the motive power. Yet this building and contents were destroyed under such explosive conditions as to raise a doubt whether any precautions would have saved it. The only possible explanation of that fire and of one other fire from which we also made a heavy loss is that an explosive gas was generated from the slow combustion of a part of the contents of the mill itself and not from any outside explosive, or oil, or gas brought into it. Such explosions have occurred elsewhere which could be proved, and the only reasonable explanation of these two losses is to be found in this hypothesis. If that be true, then it follows that this heaviest loss that we ever met would have been saved had the standard of automatic sprinkling been extended over weaving rooms.

Had that loss been saved and the eight others reduced in the manner stated, the total loss by all other fires since 1881 would have varied but a mere trifle from 10 cents per annum on each \$100 insured. That is our objective point, probably representing the least loss and the highest attainment to which our system can be brought. This objective point may be reached only by adopting the rule which the writer would adopt were he the trustee of any large property, namely, "Wherever a sprinkler can be put, put one, especially in those places where fires seem least likely to originate." It has been in such improbable places that most of our recent considerable losses have originated.

Such are the facts. According to the previous record of this company, which with some of the other senior companies have been conducted on the same rules and under the same general policy, the actual reduction in losses has been a fraction under 12 cents per \$100 for this whole period as compared to the whole previous record of this and other companies. If we allow for contingencies and call it only 10 cents, then 10 cents

on \$1,150,000,000 of risks represents a saving in this company only of \$1,150,000.

This company have carried during this whole period somewhat less than one-sixth part of the whole line of all the factory mutual companies. The junior companies have gained relatively more than the older companies by the introduction of sprinklers because their risks were at the beginning less fully protected than our risks were, but on the basis of \$1,150,000 saved in this company only multiplied by six, the total gain to members of all the mutual companies by the actual abatement of losses which their members must otherwise have paid for since January 1, 1881, has been \$7,000,000.

I have stated that on a fair computation the concession in rates, or the maintenance of rates lower than they would otherwise have been, may be rightly computed at an even sum; but if we call that concession only \$5,000,000 in place of \$7,000,000 the total benefit to the members of all the factory mutual companies through the adoption of automatic sprinklers and through the strengthening of their pump, pipe and hydrant service has been in excess of \$12,000,000 in the period under consideration.

May we not, then, be justified in calling upon our members from time to time, as opportunity may serve, to carry this means of protection to the full extent, in the expectation of again saving in a very short period more than the cost can be?

This computation is sustained by a more complete analysis of the losses to which the whole mutual system has been subjected since 1887. The motive which led the writer to press the automatic sprinkler system from the beginning to its completion grew out of the conviction to which he had come between 1875 and 1880, in watching the mutual system as director and president, that unless some new safeguard could be introduced to cover the increasing concentration of property in mill yards, the widening area of floors, the higher speeds and many new causes of fire hazard, the whole system of mutual insurance might be subjected to catastrophe at any moment, and in any event rates would of necessity be increased or dividends would be greatly lessened.

From January 1, 1877, to January 1, 1894, the losses to which all the factory mutual companies were subjected amounted to \$9,974,822.60 or a fraction under \$10,000,000. The number of claims was 884. Of course the larger proportion of these claims was on risks which had not been fully protected, as this period covers several years before any attention had been given to the automatic sprinkler as well as the whole period in which it has been gradually introduced.

In 289 instances an automatic sprinkler was in place at the point where the fire originated and where without exception the sprinklers have operated. The total loss on these 289 claims has been \$393,164.39; an average loss under these conditions of \$1360.43.

Five hundred and ninety-five claims have been made for losses where the sprinklers were not in actual service over the point where the fire originated, but in many of these instances fires have been checked or stopped by automatic sprinklers elsewhere in the works when the fire reached the protected place. In this very last month a fire has occurred in a cloth room under the most unexpected and improbable conditions.

Owing to special circumstances and conditions the upper story of this cloth room had been protected with automatic sprinklers; the lower story was not. The loss was \$34,000, almost wholly in the unprotected room; the loss in the upper story, protected with sprinklers, being very trifling. Many fires which have been checked in this way by automatic sprinklers are included in the computation of the losses on 595 claims. The amount of these claims was \$9,581,658.21, an average of \$16,103.62 per claim. Disregarding a small fraction, the one class of losses without direct sprinkler protection exceeds the other class, where sprinklers were in place, by twelvelfold.

If we bring the losses where direct action of the automatic sprinklers stopped the fire up to the average of the other class, we must add nearly \$4,500,000; if to this amount we add the immunity from loss in a very large number of fires where the sprinklers have checked the fire as stated, even though not in immediate position at the point of origin, we again reach substantially the same computation—namely, that the automatic sprinklers and other safeguards have enabled us to return to our members \$7,000,000 which would otherwise have been lost since the beginning of the year 1881.

Add to this, at a low estimate for the concessions in rate of premium, \$5 000,000, and we show an actual and constructive return upon an investment which I cannot put above \$4,000,000 to the amount of \$12,000,000.

Yet I regard the immunity which the automatic system of sprinkling gives from the interruption of business as of even greater importance than the money saved. In other words the only insurance against loss or damage by fire rests in the power of the owners of every risk, and upon them only. All that the underwriters can do is to distribute the money loss and to pay the indemnity agreed upon.

I may conclude this statement with the narrative of a little incident. One of our most careful members wrote me that he had put a sprinkler everywhere "except over the tail race." He asked if I had any reason to advise the protection of the tail race with a sprinkler. It chanced that I had a good reason to do so in certain cases although it did not apply to his risk. A few years since a break down occurred on a railway at a river, by which a tank of petroleum was burst. The oil set on fire was thrown into the river, whereon one of our risks was situated. The mill was not in operation and the burning oil backed up into the tail race and set one of the buildings on fire with considerable loss. The building itself, however, was not protected with sprinklers within, yet had there been even one sprinkler over the tail race the loss might not have been incurred!

While thus dealing with the sprinkler system we must again remark that the automatic sprinkler must be regarded only as an auxiliary, holding the fire in many instances without extinguishing it. Therefore we shall continue our urgent pressure for bringing the pump, pipe and hydrant service of every risk up to the most effective standard that can be reasonably demanded.

John B. Carey, president of the National Finishers Union of Iron & Steel Workers, with headquarters at Youngstown, Ohio, has issued a call for a convention of that organization to be held in Youngstown on August 1.

THE WEEK.

Work on the new American liners, "St. Louis" and "St. Paul," is being actively carried forward at Cramps' shipyards. The "St. Louis" is nearly plated and her interior fittings are being put in. She will probably be ready for launching by October. The "St. Paul" is not quite so far advanced, but she is reported as being also nearly all plated.

Massachusetts courts have enjoined the Sugar Trust from doing business in that State unless it complies with the law requiring corporations to file annual statements of their financial condition.

A bullet proof shield, the invention of W. F. Leonard of Brooklyn, was tested last week by the military authorities at Governor's Island, New York, with the result that balls that would have penetrated 20 inches of pine were successfully resisted by the shield. The dictum of the military officers is that the object possesses remarkable resisting power and would turn any rifle bullet, but that the material of which it is composed is too heavy for wearing by soldiers, although it might be useful for protection to field guns. The inventor has already practically tested the shield by standing up with it to be shot at by a Winchester rifle.

The House has passed a much needed bill, introduced by Representative Stone of Pennsylvania, to regulate immigration. It provides that no immigrant shall be permitted to land unless he shall exhibit a certificate signed by the United States Consul or other representatives of this country at the place nearest where the immigrant last resided, showing that an investigation concerning the immigrant has been made, and that the latter does not belong to the class of persons who are liable to become a public charge. The strict enforcement of a law of this character would do much to remove the evils arising from the admission of undesirable foreign immigrants.

According to the *Wall Street News*, the water works supplying the principal cities and towns of the United States represent an investment of \$430,000,000, or nearly one-tenth as much as is invested in railroads. The total number of cities and towns in the whole country supplied with water works is about 1700. Of these, eight Southern States only include 68 water works. About two-thirds of all the works belong to the municipalities, the balance being private enterprises.

The glue interests of the United States have been consolidated under the name of the American Glue Company, with a capital of \$2,100,000. The new combine is said to include most of the leading factories of the country.

Texas cotton crop prospects are exceedingly bright. Reports mention a probable yield of 2,500,000 bales, and it is thought doubtful if the crop can be harvested unless the fall is an open one so as to allow of picking until the end of the year.

Columbus, Ohio, and Cincinnati, are to be connected by an electric line over the National Road, running through London, Springfield and Dayton. The road is already completed from Cincinnati to Dayton, and the entire line is to be finished by the end of 1896.

The experiment of shipping naphtha in bulk was made last week for the first

time, by the steamship "Heligoland," which sailed from Philadelphia for Hamburg carrying 1,200,000 gallons of the oil in tanks. Hitherto, owing to its dangerously explosive character, the fluid has been shipped in carefully protected barrels. A great deal of interest is felt in shipping circles in this new departure.

United States Minister Buchanan reports the present year's wheat crop of Argentina to be phenomenal. The increase in acreage over last year is estimated at 20 per cent., and the yield per acre has also increased. It states that 36 000,000 bushels were exported during the first three months of this year, and there still remain in store for export 30,000,000 bushels.

A statement recently issued from the Comptroller's office at Albany, N. Y., shows that the number of New York corporations on the books for taxation has increased since January 1 from 2513 to 5944. The sworn statements of the old corporations exhibited an average decrease of 27 per cent. in the value of the capital stock as compared with last year.

Director Preston of the Mint Bureau places the world's consumption of gold in the industrial arts at the value of \$50,177,300 annually, and that of silver at the coining value as \$27,554,280, making the commercial value at the commercial price of silver during the year (\$0.78), \$16,622,980.

Advices from England, France, Germany and Scotland say that the largest crops of hay known in several years have been harvested in those countries.

Heavy sugar importations continue at the ports of New York, Boston and Philadelphia. Not only sailing vessels but transatlantic steamships also have been temporarily diverted from their deep sea routes to accept the high freights offered by the Sugar Trust for spot cargoes.

American Smokeless Powder.

The American smokeless powder, invented by Leonard, scored a remarkable success under tests conducted by the Naval Ordnance officers at the Indian Head Proving Grounds on Saturday. With 85 pounds of Leonard nitro-glycerine smokeless powder behind a 250-pound projectile in an 8-inch rifle, the enormous muzzle velocity of 2650 feet per second was secured with a chamber pressure of only 14.8 tons. The comparison of this with the best brown hexagonal powder, the regular service powder, shows its infinite superiority thereto. The service powder, under similar conditions, gives but 2100 feet velocity with 15 tons pressure. The only doubtful point in relation to the Leonard powder is its keeping qualities, which have yet to be demonstrated. Its makers claim it, however, to be entirely satisfactory in this respect. Hitherto, powders composed in part of nitro-glycerine have been found to deteriorate rapidly when exposed to the vicissitudes of climatic changes.

The Zucker & Levett Chemical Company and the Loeb Mfg. Company have consolidated, under the corporate name of Zucker & Levett & Loeb Company, with offices at 8, 10, 12 and 14 Grand street, New York. The new concern, with their increased facilities, are prepared to promptly execute orders.

San Francisco News.

For some little while past many of our foundries have depended on supplies by rail, which have now ceased altogether. Imports by sea have been for some time very light indeed. A trip through the foundry section of the city during the week developed a very demoralized condition of affairs. The Pacific Rolling Mills are not affected by the stoppage of the mails, but inasmuch as their whole supply of pig iron comes from Georgia and Alabama by rail their supply of raw material is cut off completely. And not only this but their business lies chiefly in the country, and they are unable to make any shipments in that direction as far as railroad business is concerned. The Union Iron Works are not doing anything requiring the use of bar or plate iron, and are therefore not affected by the strike. The Risdon Iron Works obtain their supplies in the same way as the Pacific Rolling Mills and are hampered in like manner. Their principal trade, too, is outside of San Francisco, and at present they can ship only by sea. And this is true of most of the other foundries, machine shops, &c. But it is not as bad as it would have been at a more active season, or at any other period of the year. The trouble has for the time being put a stop altogether to business in agricultural implements as none can be received overland, none can be shipped from Stockton or Benicia, from the factories and none from this city except by sea.

The usual demand for builders' hardware for the city continues, but this at present is hardly sufficient to keep the wholesale establishments open. The same thing may be said of all articles in the line of iron or steel. I may say here that the extremely low freights that have been charged for pig iron have thrown most of the business into the markets of Georgia and Alabama. The freight is only \$3 a ton by rail, and as it is impossible to beat this by sea there is but a poor outlook for English or Scotch or other foreign iron with the proposed tariff. This, however, will not at all inure to the benefit of the iron industries of this coast, as their interests all lie in importation of foreign iron free of duty, otherwise Eastern machinery will always be able to be transported to this coast and laid down here in the majority of instances cheaper than it can be made here. In this respect our only salvation is in raw material, duty free, or the finding of beds of good iron ore near to cheap water transportation, and with cheap fuel in the neighborhood for the manufacture of pig iron.

The "Monowai" is to land from Sydney with 890 ingots of Australian pig tin, and the "Oceanic" with 40 ingots of Banca, making a total of 7497 ingots of Australian and 1230 ingots of Banca since January 1. There is very little demand, as packers have been going slow. The market is quiet at 20½ cents. For similar causes the market has been dull in tin plate. The floods in the northern rivers put a stop to the operations of the canneries for some time, but they have started up again, and we look for a better demand from this quarter. Packers of canned goods are going slow, and demand is in consequence light. There have been no imports for some time, but stocks are sufficiently ample for all the needs of the market. Prices remain without change, on the basis of \$5.50 for coke.

The nail market has fluctuated slightly for some time, and has now settled down to \$1.50 as the basic price for iron. Up to date of the railroad tie-up overland imports had continued to increase, despite the fact that general business was very light. For the last week receipts in this city had reached 68 cars, principally of pig and other iron and pipe.

CORRESPONDENCE.

Steel Making in the South.

To the Editor: The valuable contribution of J. B. Nau, "American vs. European Steel," in *The Iron Age* of April 26 and May 3, has reopened the discussion on steel making in the South in general and, as is but natural, in the Birmingham district in particular.

Mr. Nau's paper coming out in a time when the talk of the immediate erection of a great steel plant is again indulged in by the local papers and by individuals of reputation as great developers and of supposed influence in financial circles, has attracted more than ordinary attention. While it is more than probable that this steel works project will resolve itself into wind and smoke as usual, not because there is any question of doubt as to the feasibility of making steel from the raw material at hand, but because corner lot speculations, which form the main incentive, are still at a discount, and especially because it is difficult to decide whose lots shall be enhanced in value by the boom that can be worked up in a neighborhood by virtue of locating the steel works there, nevertheless technical discussion of the processes to be used and of the probable cost of production will be of great service in clearing away the doubts that may still linger with those that would favor the erection of a steel plant as a legitimate business enterprise, rather than a land booming institution. Mr. Nau's article is of more than ordinary value because it gives facts and figures obtained from actual experience in what is being done abroad, and although Mr. Talbot's suggestion that it will not be Belgium or Germany, but Pittsburgh, that will have to be met in competition is undoubtedly correct, this does not depreciate Mr. Nau's services in the least. He shows beyond a question of doubt that the South and especially the Birmingham district has in every way the advantage over the European steel making districts that are most likely to come into competition.

The Southern ores, although lean when compared with those of Lake Superior, are considerably richer than those of Belgium and Germany. They are also more abundant as well as more available, having the advantage of both cheapness in mining and low cost of transportation. The coal is just as good if not better and not one-third as expensive. What advantage the European competitors may have in price of labor should be fully overcome by American ingenuity and labor saving appliances. The acid process, both Bessemer and open hearth, is excluded from the Birmingham district by the very nature of the raw material.

Mr. Nau dwells very largely on the basic Bessemer process, probably not because he is convinced that that would be the most feasible and economical for the conditions of the Southern iron districts, but because his personal experience perhaps as well as the nature

of the comparison he makes brings that process out more prominently.

While the basic Bessemer process is not entirely impracticable, yet the raw materials of the South and especially of the Birmingham district are far better suited to the basic open hearth process.

In the first place basic Bessemer pig iron cannot be made there without the introduction of phosphate rock, which would have to be brought from a considerable distance and would add materially to the cost. The value of the basic slag as a fertilizer should counterbalance such extra cost, but as it would, in all probability, take a full generation before the average mossback of Alabama could be educated to the advantage of buying basic slag for fertilizing purposes it would be unwise to figure on that as a source of revenue.

It is also quite probable that the basic Bessemer steel would have an extra prejudice to overcome in the market, it being almost entirely unknown in this country. And right here arises a question which should be very seriously considered by those who would invest money in a steel plant as a legitimate business enterprise, irrespective of side speculations, which is this: that Birmingham steel, when its production in large quantities shall suddenly have become a fact, will have to make for itself a name and a market before it can be disposed of in any considerable quantities at the real market value. Architects, as well as civil and mechanical engineers, will hesitate much before they will specify steel of an unknown brand in structures of any considerable size and importance. Its introduction will be necessarily slow at first, and can be hastened only by placing on the market nothing but strictly first-class material.

With a new plant, green hands, strange raw materials and unfamiliar conditions, the most experienced and expert steel maker will require some time before satisfactory results can be uniformly depended upon, so that profits cannot be reasonably expected for some considerable time after starting up.

If the T. C., I. & R. Co. are really in earnest about erecting a steel plant, and they are the proper people to do it, they should begin the manufacture of steel at once; in fact, it should have been carried on right along by them. They have right there a steel plant of sufficient size and sufficiently equipped to answer the purpose of an experimental plant, in which to train a nucleus of men in the art and practice of steel making, in which to determine which grade and class of pig iron is best suited, and to thoroughly acquaint the melter with the nature of the available raw material—pig iron, reducing ore, basic and refractory material—and last, but not least, to familiarize the consumers with Birmingham steel. It is quite probable that this plant, even under the present unfavorable market conditions, could be run without a loss, but whatever the loss might be it would be manifold restored by virtue of the experience gained and by having opened the market, thereby avoiding, or, at least, very materially shortening, the period that a large new plant will necessarily have to run at a loss before the necessary experience and the required market will have been gained. This, however, is only by the way, and for all the good it will do is, perhaps, just so much printers' ink wasted. It is sound logic and good advice, nevertheless.

Mr. Nau is the inventor of a desilicizing process in combination with a

blast furnace, to which he alludes in his article and for which he claims certain advantages. This is quite natural and perfectly proper. That the duplex process is not only feasible but efficient and economical, is established beyond doubt by its continued practice at Witkowitz and at Hoerde. If it should therefore be found that iron cannot be regularly produced sufficiently low in silicon without passing the danger line in sulphur, there would be nothing in the way to prevent desilicizing by blast in a vessel of proper size and construction.

Whether Mr. Nau's plan of desilicizing at the blast furnace and with the blowing power of the latter is really the best, may well be doubted; but Mr. Talbot's mode of criticism (*Iron Age*, June 7), making himself a little man of straw, and then demolishing the same by mere force of opinion and belief, does not dispose of Mr. Nau's plan, however uneconomical it might be.

Mr. Talbot asserts that in a vessel of proper size for the work of desilicizing, which he assumes to be of 5 tons capacity, the furnace would be robbed of its blast five to six hours out of every 24, and that it would be necessary to cast 30 times a day, and with a vessel of double that size (which he considers impracticable), at least three hours would be consumed in the process of desilicizing. This criticism cannot leave a sign of a doubt that in the hands of Mr. Talbot Mr. Nau's process would be an absolute failure.

Mr. Nau in his rejoinder to Mr. Talbot comes to a very different conclusion. He proposes to use a vessel of 25 to 30 tons capacity, which he calculates, without giving any figures, however, can be desilicized in five minutes. Assuming an output of 150 tons per day six casts only would have to be made, against four, or possibly only three, in the ordinary running. He assumes that at least five minutes would be needed to close in the notch, this would require a minimum delay of 15 minutes in 24 hours, and as six blows at five minutes each would require 30 minutes, he concludes that actual loss to the furnace would not exceed 15 minutes. We therefore have Mr. Talbot's assertion that it will take five to six hours out of every 24 against Mr. Nau's statement that it will not take over 15 minutes. Such a great difference in statements should not and would not occur in an honest and fair discussion, by competent parties, on a subject so well known as that under consideration. It is therefore quite evident that both of these combatants have allowed themselves to be carried beyond their better judgment by the heat of the discussion, and that the truth lies somewhere between the figures given.

Both parties speak of producing a certain effect by blowing so many minutes, irrespective of the quantity of metal blown or the quantity of air delivered per minute, as though the time to produce a certain effect, or the effect produced in a certain time, did not depend on either of these quantities.

Mr. Talbot states that a 5-ton vessel will "consume at least 10 to 12 minutes," from which he follows that 150 tons would require 30 times that long, or five to six hours, and that if the vessel were made twice as large, which he considers impractical, only half the time would be required to desilicize. Mr. Nau, on the other hand, after making the general statement that in the ordinary acid vessel, under ordinary conditions we presume, about 50 per

cent. of the silicon, 20 per cent. of the carbon and between 20 to 80 per cent. of the manganese are removed after four minutes' blowing concludes that, such being the case, he can desiliconize 25 to 30 tons of metal in four to five minutes, and consequently 150 tons in six separate blows in at most 30 minutes.

It may help to clear matters up to do a little figuring on this subject on the following basis: 1. That everything else being the same the amount of iron made in a given blast furnace is directly proportionate to the quantity of blast delivered to it at the tuyeres—i. e., to the weight of oxygen it so receives. 2. That the weight of oxygen required to remove a certain per cent. of silicon from an iron bath will be directly proportional to the weight of iron to be desiliconized. With a given blowing capacity, therefore, the time of blowing must depend on the work to be done. This being so it is an easy matter to calculate what portion of the time the furnace must necessarily be robbed of its blast in order to desiliconize the iron produced.

We will assume that to make a pound of iron will require a pound of fixed carbon. This is less than the furnaces of the Birmingham district are using now, but very probably more than they will be using by the time a large steel plant shall have become a fact in that section of the country.

We will assume also, with Mr. Nau, that 1 per cent. of silicon is to be removed, and that with this 20 per cent. of the carbon, 50 per cent. of the manganese and 3 per cent. of iron will also become oxidized.

If we further assume that 85 per cent. of the fixed carbon of the coke consumed in the blast furnace will be oxidized by the blast to CO at the tuyeres, we will require for each net

ton of iron produced $\frac{85 \times 2000 \times 16}{100 \times 12} = 2267$ pounds of oxygen from the blast.

1. To desiliconize this metal will require $\frac{2000 \times 32}{100 \times 28} = 22.86$ pounds of oxygen to oxidize 1 per cent. of the silicon.

2. The oxidation of 3 per cent. of iron to F_2O_3 , which necessarily accompanies the process, will consume $\frac{2000 \times 3 \times 64}{100 \times 168} = 22.86$ pounds of oxygen.

3. The Birmingham iron containing 0.3 per cent. of manganese, one-half of which is burned out, we have $\frac{2000 \times 0.15 \times 48}{100 \times 110} = 1.31$ pounds of oxygen consumed for that purpose.

4. To remove 20 per cent. of the 3.5 per cent. of the carbon contained in the iron, which we will assume to be oxidized to CO, will require $\frac{2000 \times 0.7 \times 16}{100 \times 12} = 18.76$ pounds of oxygen.

Adding all these oxygen requirements together we have:

Oxygen Required to Desiliconize 1 Ton of Iron.

	Pounds.
Removing 1 per cent. of silicon	22.86
Burning 3 per cent. of iron	22.86
Burning 0.15 per cent. manganese	1.31
Burning 0.7 per cent. carbon	18.76

Total..... 65.70

As we have seen it takes 2267 pounds of oxygen to produce 1 ton of iron in the blast furnace; it will therefore take $\frac{65.70}{2267}$ of that time to desiliconize the

same, or $\frac{65.70 \times 24 \times 60}{2267} = 41.73$ min-

utes every 24 hours to blow the metal produced by the blast available.

This represents the absolute minimum, and makes no allowance for delays of any kind which are bound to occur. Taking these into consideration it would not be safe to figure on less than an hour that the furnace would be deprived of its blast on account of desiliconizing with the furnace blowing engines. This within itself would probably not seriously disturb the operation of the furnace, and the advantages might still greatly outweigh the disadvantages.

But there are other considerations which must be taken into account. Of these the first and most important is the question of steam. As a rule there is not more than is required to run the circulating pumps, electric lights, &c., during the interval that the blast is off the furnace, and in consequence the fire under the boilers is entirely out or much lower. It is difficult to keep the steam up if this interval is at all prolonged, even with the blowing engines shut down. To run them at full power, which is necessary to fulfill the conditions upon which our calculations are based, would require heavy firing, which is in itself objectionable and expensive, and the more so because the boilers, being designed and set to burn gas to the best advantage, are poorly adapted to coal firing.

The second consideration is that the intervals at cast afford the only opportunity for the engine tender to look over closely and feel of his engines, which is quite important and could not be done if the desiliconizing process is to be accomplished as much as possible during those intervals, and this might lead to accidents and delays. There are other considerations which it is needless to dwell upon, but in general it may be said that the tendency of the most advanced and successful engineering practice is in the direction of providing mechanism and apparatus especially adapted to the work to be performed, rather than combining and rendering interdependent the several necessary operations. There may be locations and conditions under which Mr. Nau's plan of desiliconizing at the blast furnace and with the blowing machinery of the furnace may be of advantage, but in connection with a first-class steel plant it can hardly be recommended.

Mr. Talbot's criticism of the pneumatic process of desiliconizing in general, and Mr. Nau's plan in doing it in particular, as well as his criticisms of Mr. Nau's cost estimates, were pretty severely refuted by Mr. Nau in his rejoinder in *The Iron Age* of June 21. The Talbot process also fares rather badly. His statement concerning Mr. Nau's invention—viz.: "This process is not new, has been tried in various works, and wherever it came under my notice failed"—is very unkind to say the least, and Mr. Nau's rejoinder concerning the Talbot process is equally harsh when he says: "If that gentleman means to say that he invented a method by which he is enabled to desiliconize and dephosphorize liquid metal by mixing it intimately with basic cinder which has already been used to that purpose, or which is rather the result of such a proceeding, he should show the result of tests made therewith, . . . but when Mr. Talbot speaks of tests made in the South and in which tests he used a mixture of fine iron ore and basic cinder to remove sil-

icon and phosphorus from liquid iron, I cannot help thinking that it looks very much like the Krupp washing process, which is in use since 1877, &c.," and concludes, "in the presence of these facts does Mr. Talbot still consider himself the inventor of that process?"

There is nothing to be gained by that kind of polemics, neither for the art nor the science of metallurgy, much less does it promote the good fellowship so desirable among members of the profession. Both Mr. Nau and Mr. Talbot have no doubt expended a considerable amount of brain energy in developing and perfecting their processes, and both gentlemen have thereby contributed to the progress of their profession. That neither of them has had an opportunity to demonstrate the peculiar value of their inventions and to show what is really new, should be no cause for discrediting them, and least of all should they themselves misapply their energies in belittling one another.

When it comes to inventing something actually new in these days, and in a profession in which so much talent and thought is directed into every nook and corner of both theory and practice, it will be found probably the result of good luck and chance, as well as hard application and study, if it happens that the results of one's labors have not been, in a greater or lesser degree, anticipated by others working in the same field.

For this reason all supposed new inventions and improvements should be studied with a view to determine their real merit, rather than to seek to throw discredit on the inventor because something similar has been attempted or even successfully accomplished before him.

There is still much room for improvement all along the line; but the chances for radical and absolutely new inventions are becoming few and far between. Wholesome criticisms based upon facts and figures are always in order, however, and will help rather than retard every meritorious invention.

What has all this to do with steel making in the South? Directly nothing; indirectly a great deal. Both Mr. Nau and Mr. Talbot have evidently given this subject considerable study. They both have invented means, or perhaps more correctly, improvements in the means, by which they propose to treat the pig iron as now produced, to render it more perfectly adapted to be converted into steel by the basic process.

Either or both of these inventions may become a factor in the economical production of steel, and for that reason these improvements should be discussed fairly and honestly, with a view to bringing out their merits as well as shortcomings, and not in a manner to belittle the labor performed by those who are bringing them forward.

Pig Iron.

On Wednesday evening, the 18th inst., the strike at the plant of the National Tube Works Company, McKeesport, Pa., was declared off and the men are returning to work as rapidly as places can be found for them. It is probable that the plant of the National Rolling Mill Company, an identified interest of the National Tube Works Company, will also be put in operation at an early date.

The Senate Committee on Territories has decided to recommend the admission of Arizona and New Mexico as States of the Union.

The Iron Age

New York, Thursday, July 26, 1894.

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CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

The index of *The Iron Age*, Volume LIII, January-June, 1894, is now ready, and may be obtained on application to David Williams, publisher, 96-103 Reade street, New York; or to 220 South Fourth street, Philadelphia; Room 509 Hamilton Building, Pittsburgh; 59 Dearborn street, Chicago; Rooms 22-24 Pickering Building, Cincinnati; Bank of Commerce Building, St. Louis; 146 Franklin street, Boston, and 312 The Cuyahoga, Cleveland.

A Time to Push.

One cannot help feeling a high degree of admiration when he chances to meet a manufacturer or merchant able to overcome the depressing influences of the times. There are men who have shown themselves capable of building up and extending their business in the teeth of the hard times and in spite of the diminished consumption of goods. In some way they have managed to secure a piece of the touchstone of success and they pursue their way without regard to discouraging conditions, managing in some fashion to transmute them to something of benefit. A case in point, which recently fell under the observation of the writer, is that of a manufacturer of articles of a quasi staple character who spent a very short time mourning over the dullness of trade last year. Realizing that something had to be done if he proposed to continue in business, he studied thoroughly the equipment of his factory to see how it could be improved and his cost of production cheapened. Investigation disclosed the desirability of some special machinery for certain work and the installation of better machines in other departments to make the labor done there more effective. Orders were sought on a new basis and a fresh start was taken. From that time a steady gain was made from month to month in the volume of business handled. Further than that, the impetus thus acquired was due to such a plain cause that the manufacturer has profited by the lesson learned and is now on the alert to see what new machine or new method he can introduce to keep up the speed. For him 1894 may be remembered as a year of very hard work, but not as a time of business stagnation and wasting capital.

While it will probably take some little time for general recuperation from the severe depression that has visited us, and it is too much to hope that

everybody can institute reforms which will be productive of immediate benefit, yet there is no doubt that many an individual might be able to accomplish much more than he is now doing if he were to thoroughly and systematically study how to improve his plant or his processes or his methods of advertising his special products. There are very few manufacturers who will not find room for improvement in at least one of these particulars, and most of them will find that all of them need to be overhauled and reconstructed. It is a good time to clean house, get the rubbish out of the corners, freshen everything from cellar to garret, and let the sunshine of enterprise penetrate the windows which have so long been neglected that they are covered with cobwebs. The machinery builders are now so slack of work that there never can be a better time for building improved machinery. Use some of the capital now lying idle in putting in a better or larger engine, better boilers, machines that are up to the times, and the good effects of such a movement will soon be apparent. Strive to make a better article than your neighbor, even if you have to sell it for less money, and let the world know it. This will bring success, and prosperity will crowd depression into the background.

Getting to Work Again.

Factories of every kind are resuming operations all over the country. Operations had in numerous instances been suspended for lack of fuel after the coal strike became general. Other concerns closed until wages were settled for the coming 12 months. Very many shut down on account of the railroad strike, which cut off their receipts of materials as well as prevented shipments of products. In other cases it was necessary to take some time for repairs usually done at this season of the year. It is gratifying to note that the resumption of work is quite general. Among those which have started up are not a few whose owners but a short time since were in doubt as to whether they would not find it impracticable to reopen their doors until well into the fall. That they have come to a different conclusion is evidently due to the fact that the demand for their goods is improving and prospects for business are therefore brighter. The Western banks report a better demand for money from their country clients, which they are pleased to see. The currents of trade are beginning to flow again and the movement thus begun may reasonably be expected to gather strength until the producers of raw products are also affected. As long as so many furnaces are out of blast and steel works are idle or running light, the business of the country is seen to be not in a healthy condition. But they may be expected to gradually fall in line from this time forward. The worst is over and the country is far from being ruined.

Novel Use of Photography.

A photographic equipment has now become a most important factor in almost all manufacturing establishments. In some cases it is considered so essential that it rises to the dignity of a department, and is looked upon not as a fad or recreation, but as a part of the plant entitled to the greatest respect. Its field of operations is no longer confined to the mere photographing of completed machines—it is now employed to picture every interesting or difficult piece of work. The views thus obtained form a record having a certain money value and which exert an influence on the methods pursued. These records have in some instances caused radical changes to be made in plans, the result being the production of better work at reduced expense.

This is illustrated in the case of the Builders' Iron Foundry of Providence, where the camera has a wide application and where its importance is recognized. An outline of some of the work it does may be of interest. We will suppose that a blow hole has been brought to light in a steel casting received from another concern. When received the casting appeared to be perfect, but the machining showed the defect. The photograph showing this defect proves to the works who furnished the casting that it was imperfect, and they are as satisfied as if they had the casting at hand to examine. While a large casting was being drilled the drill broke, the machinist claiming that it entered a blow hole and was deflected. The piece was split through the hole, which was carefully cleaned of oil and chips and then photographed. This picture, sent to the foundry where the casting was made, saved all dispute, since the story it told was accepted without hesitation.

In their own castings the Builders' Iron Foundry have found the camera to be of value. If a defective casting comes from the mold it is photographed. If this defect appears repeatedly in the same place it proves that there is something wrong with the method of doing the work. A close study of the subject points the remedy and there is no trouble with that particular job in the future.

Perhaps one of the most important parts played by photography in these works is in obtaining a record of a difficult piece of work as it advances. Each step in the making of an intricate casting is photographed, this collection of pictures forming a sort of progress sheet that shows the method in perfect detail. If this casting is to be duplicated six months afterward, the pictures are all sent to the foreman of the foundry. They recall to his mind the exact way in which he formerly did the work and serve to solve any doubts he may have as to the correct course to pursue. They also allow a possible successor to study closely the method of work prevailing in former times.

The above brief sketch proves that

photography, judiciously and systematically applied, may be made of great use. Applied in a haphazard way merely for the sake of the pictures and not for the story they tell the camera becomes only a toy, having no right in the shop.

The following extract from a Moline, Ill., newspaper is a sample of what is now going on in many branches of industry:

Deere & Co. have received an offer from an implement house for 10,000 plows to be furnished at a certain price, and they are now figuring to ascertain whether or not they can manufacture the plows for the price offered. The plows are said to be of low grade, and inferior in point of workmanship to those upon which Deere & Co.'s employees have heretofore been working. C. H. Deere says that if they find that the plows can be made at the price named without loss to the company the offer will be accepted for the purpose of giving employment to the men.

The implement house making the offer is evidently managed by shrewd men, who see an opportunity to sell plows if they can make a tempting price on them. They propose to make an effort to meet the conditions now ruling, but can only do so by the aid of the manufacturer. And they find the manufacturer so anxious for business that he is ready to undertake the contract at no profit. For whose benefit is a factory run under such circumstances? The workmen have no capital invested and take no risks, but get their wages on the regular pay day, just as though everything was lovely and all concerned were making money. Is this "profit sharing?" Isn't it better for the men than profit sharing?

Submarine Cables.

At a celebration in London last week of the twenty-fifth anniversary of the laying of the submarine cables to the far East, Sir John Pender, the English pioneer of submarine telegraphy, spoke of the early struggles of the companies engaged in this work, and the conspicuous part taken in them by the United States. In regard to his own company, the Eastern Telegraph Company, Sir John stated that its nucleus, 25 years ago, was 900 miles of cables and \$1,250,000 capital. Now it is 51,325 miles of cables and a capital representing nearly \$75,000,000. At present, he said, the total mileage of submarine cables was, in round numbers, 152,000 miles, of which 90 per cent. had been provided by private enterprise, costing altogether over \$200,000,000. The total length of land wires throughout the world was over 2,000,000 miles, estimated to have cost about \$325,000,000. If the cables and land lines were added together a combined capital was represented of \$525,000,000.

Twenty-five years ago it was considered wonderful to receive a message from India in a few hours. To day telegrams arrive in a few minutes. The Eastern Telegraph Company commenced business by carrying at the rate of 400,000 messages per annum. To-day they transmit over 2,000,000. Submarine telegraphy had undoubtedly equalized trade throughout the world and brought the producer and consumer closer to-

gether, enabling the producer to obtain a better market and the consumer to benefit by international competition. Moreover, it had over and over again prevented diplomatic ruptures and consequent war, and had thus been instrumental in promoting peace and happiness throughout the world.

OBITUARY.

JOHN J. YOUNG.

Col. John J. Young, for many years a resident of Allegheny, Pa., died suddenly from an attack of heart disease at his home in Canton, Ohio, on Saturday, the 21st inst. Colonel Young was born in Pittsburgh on October 14, 1836. He entered Jefferson College in 1852, graduating with high honors in 1856. On the completion of his collegiate course he went to Chicago, Ill., where he studied law. He was admitted to the bar there in 1859, and returning to Pittsburgh, was admitted to the Allegheny County bar in 1861. In July, 1862, Colonel Young recruited and organized Young's Independent Battery G, Pennsylvania Volunteer Artillery. At the close of the war Colonel Young accepted the position of special attorney and general agent for Hussey, Wells & Co., at Pittsburgh, which firm afterward became Hussey, Howe & Co., and, finally, Howe, Brown & Co., Limited. He continued his connection with this firm until six years ago, when he accepted the presidency of the Canton Steel Company, at Canton, Ohio, which position he held at the time of his death.

MORDECAI W. JACKSON.

Mordecai W. Jackson died at his home, at Berwick, Pa., on July 18, aged 82 years. He was the founder, 60 years ago, of the Jackson & Woodin Mfg. Company of Berwick, makers of cars, car materials and implements, and had been continuously identified with that important concern during the whole period. He saw its development from a small plow foundry into its present proportions, doing a business of several million dollars yearly, with works covering 75 acres. Mr. Jackson was president of the First National Bank of Berwick, Associate Judge of Columbia County, a trustee of Dickinson College, at Carlisle, and a trustee of the State Asylum for the Insane, at Danville, besides holding many other positions of honor and trust. He was distinguished for his large hearted charity, and was universally beloved and respected in his own neighborhood.

JOHN C. MOULTON.

The death is announced at Laconia, N. H., on July 23, of Hon. John C. Moulton, one of the best known and wealthiest business men of New Hampshire, aged 84 years. He was for many years head of the Laconia Car Works, and president of the Nashua, Acton & Boston Railroad, besides filling many State, municipal and commercial offices, including State Senator, postmaster and member of the Common Council.

Geo. S. Rice and Geo. E. Evans of Boston have reported in favor of an additional supply of water for New Bedford, Mass., the estimate including 54,000 feet of 48-inch steel conduit, \$437,000; two 5,000,000-gallon pumping engines, \$25,000; one 10,000,000-gallon pumping engine, \$50,000; total, \$710,000.

Washington News.

(From our Regular Correspondent.)

WASHINGTON, D. C., July 24, 1894.

The Bethlehem Armor.

Everybody was pleased with the successful outcome of the second trial of the Bethlehem 18-inch Harveyized nickel steel plate representing the side armor of the "Indiana." In a measure, the reputation of the Harvey process as applied to very thick plates was also involved in the result. The plate was the same as the first, 16 x 17.5 feet and 18 inches thick from the top to 41 inches from the bottom, where it tapered to 8 inches thick. It weighed 34 tons.

First Shot.—Carpenter armor piercing projectile, 850 pounds, 249½ pounds powder; velocity, 1465 f. s.; energy, 12,665 foot tons; impact, 54 inches from right end, 10 inches above taper; penetration, 8 inches; shell crushed and broken. One fragment of 10 pounds weight a number of seconds later fell on the 10-inch gun, making a heavy indentation. The plate remained sound and uncracked.

Second Shot.—Projectile, Carpenter A. P., as before; charge, 397½ pounds in four cartridges; velocity of projectile, 1926 f. s.; energy, 21,883 f. t.; impact, 50 inches from impact No. 1, or 30 inches from top and 20 inches from bevel; estimated penetration of projectile, 14 inches; shell head mashed into wedge shape and split the plate along the nearest line of bolt holes in the back. This test was in a scientific point of view one of the most important of the whole series. The naval experts are awaiting the full official data with much interest and some opinions may be expected in reference to the present methods of treatment and the race for superiority between plates and projectiles.

The Tariff.

The tariff situation which has grown out of the disagreements between the two Houses of Congress and the President's letter sustaining the House bill and criticising the Senate has very radically increased the complications which surround this measure. There will be several days of speechmaking in the Senate, after which the present excited condition of things will doubtless subside and an agreement will be reached leaving all the schedules intact as they passed the Senate, except the abandonment of the ½ cent differential and adoption of a compromise rate of 42½ per cent. ad valorem on sugar (the Louisiana Senators ask 45 per cent.) and about 25 cents a ton on iron ore and free coal.

It is thought that this will be the outcome in the end, although a protracted struggle is possible with the defeat of the bill, but not probable. The managers expect to find some way out of the muddle.

Aluminum Castings.—We have received from the H. H. Franklin Mfg. Company of Syracuse, N. Y., a number of samples of small aluminum castings, which show marked progress in this class of work. We understand that they have been produced by a new process. Among the samples is a gear wheel, 1½ inches in diameter, with 36 teeth, which are sharp as though cut. A rack and a ratchet wheel, both cast, have some of the surfaces beautifully

polished. The makers claim that they have overcome the difficulty of shrinkage and that they can make castings from a fraction of an ounce up, accurate and to size. We are informed that on many lines of work the finished product in aluminum, even at the present price of the metal, can be produced highly polished cheaper than the same article can be made and finished and plated in brass. The H. H. Franklin Mfg. Company produce these castings from pure aluminum, but when it is desirable to avoid the danger of scratching polished surfaces, the work can be produced with any hardening alloy. It is probable that there is a wide field for small castings of this character.

Proposed Legislation Relating to Care of Steam Boilers.

There is always some danger that special legislation directed toward the suppression of existing evils may fail of its object by the introduction of ill considered and impracticable features. Particularly does this liability exist when those not skilled in framing laws attempt this difficult work. Legislation is, so to speak, one of the arts of statesmanship; and when those who are not trained in the art, however skilled they may be in other walks of science or business, attempt to frame laws, they are quite as apt to make a mess of it as a very good lawyer might be if he attempted to make shoes, or as a skillful surgeon might be should he undertake the execution of plumbers' work. Proposed measures have been brought to the notice of the steam and hot water heating trades having for their purpose the legal regulation of the care and attendance required in the operation of steam boilers. The proposal seems to have been favorably regarded in some quarters, and, either in its present form or with some modifications, is likely to be brought forward again before long. It is held by the promoters of this measure that no employer ought to exact from employees caring for and operating stationary engines and boilers any kind of work except such as is involved in such operation and care; and it is proposed to legally prohibit such exactions with penalties both for employers who demand and employees who submit to them. The intent is, obviously, to reach and suppress a practice which while sometimes leading to dangerous neglect on the part of engineers in charge of steam plants, does not relieve them of responsibility for such neglect when damage to life and property results.

Engineers in charge of engines and boilers used for power purposes only, for heating purposes only or for both these purposes simultaneously—the latter use being constantly on the increase, as in the rapidly multiplying large office buildings of our cities—are frequently called upon to leave their legitimate and special work to perform repairs of machinery, to do plumbing work and even painting and carpenters' work. Derangements of the steam plant may occur during their absence, which if not at once attended to may either induce dangerous conditions or be attended with immediate destruction. If the latter result the engineer in charge is usually blamed and not unfrequently punished, while the underlying fact is that, in most cases, his neglect is not willful, but enforced by the demands of his employer. This practice admittedly calls for some restrictive meas-

ures, and perhaps legislative enactment could be made to cover the necessary ground without introducing undesirable features. It will, however, be found no easy task to provide suitable and adequate legal remedies.

The history of special legislation of this kind shows that it is liable to be made at first altogether too broad and comprehensive. Subsequent reconsideration and amendment are found necessary to remove burdensome evils imposed by conditions not at first recognized and in ways not at first foreseen. As a case pertinent to the proposition under discussion, let us cite a small shop wherein a portable engine of, say, 2 horse-power supplies all the power needed for such work as is not performed by hand. Such an engine usually stands on the shop floor, and a machinist running a lathe or some other tool near it is charged with supplying the engine with fuel and water, keeping it oiled and maintaining it in good running order. No one having a practical knowledge of the real necessities of the case would insist that such an engine requires the full time of a skilled engineer. The terms of any enactment directed to the regulations of care and attendance required by steam boilers should, therefore, discriminate between such a plant and one which comprises one or more large engines for power purposes, or one which, perhaps, comprises a set of passenger elevators, dynamos for electric lighting and heating apparatus of capacity for warming the largest buildings. Thousands of factories exist where large or small steam boilers, working under low pressure, are used for heating liquids in tanks or vats. Discrimination would be necessary between extensive dye works, employing boilers of perhaps 100 horse-power and, say, a cheese factory only needing a 4 or 5 horse power boiler, with automatic damper and water feeder, for warming milk and supplying hot water for cleansing vats and utensils. Low pressure boilers for domestic heating, with gravity returns, could not be properly included in the same category as high pressure boilers. Many other distinctions relating to uses, pressures, situations and limitations must be regarded in order that any law, while reaching the real evil it is sought to remedy, shall not be so handicapped with impracticable and unwise provisions as to neutralize its usefulness.

PERSONAL.

J. F. Holloway, who is widely known in engineering circles, is now connected with the Snow Steam Pump Works of Buffalo, with headquarters at New York.

Chas. M. Schwab of the Homestead works will soon sail for Europe for a brief rest.

Andrew Carnegie is expected to visit Pittsburgh in the fall.

The Reorganization Committee of the Pennsylvania and the Maryland Steel companies held a meeting at Philadelphia, at the conclusion of which Effingham B. Morris, the chairman, announced that the plan of reorganization had been agreed upon. Over 90 per cent. of the creditors have assented to the plan and a sufficient amount of preferred stock has been subscribed to warrant the committee in declaring the plan for judicial sale to be effective. This course was adopted by the committee

and the time for subscription by all stockholders to the new preferred stock was extended until October 1 next. Stockholders holding the present common stock who do not avail themselves of this opportunity will then be wiped out, as the company will now be reorganized for the benefit of the creditors and subscribers to the new preferred stock to the amount of \$1,500,000 only. The payments for this stock will be in installments at convenient periods, beginning January 1, 1895.

Trade Publications.

A VERY HANDSOMELY ILLUSTRATED PAMPHLET, measuring 11 x 16 inches, has been prepared by the Harrisburg Foundry & Machine Works of Harrisburg, Pa. It describes their double engine steam road roller for rolling, picking, and plowing, and which is also modified for rolling dam or reservoir embankments, and as a road locomotive. An interesting part of the pamphlet is found under the heading "Evolution of the Harrisburg Roller." The single engine roller built by this company in 1880 weighed over 50,000 pounds. It was built to order, the purchasers having the single object in view of getting a machine giving the greatest possible compression, based upon a theory that if 10, 12 or 15 tons were good, 25 tons would be correspondingly more effective. The other equally essential requirements, of easy manipulation under all conditions of roadway, the effect upon sewers, pipe lines, bridges, &c., in the transfer of the machine to the work, were lightly considered at the time. While its locomotive power was equal to the requirements its sphere of useful work was greatly curtailed on account of its excessive weight. A number of single engine rollers of 10, 12 and 15 tons weight were built in 1884. These were designed with greater regard for stability, workmanship and finish in every detail and proved entirely practical, all being in successful operation at the present time. This machine was intended to be used as a road machine, and in addition was equipped as a portable engine, with governor, band wheel, &c., for the transmission of power, with the then prevailing idea that these machines would be used for driving stone crushers or any machinery, if desired. Experience proved that in making sacrifices of more important features to obtain this result, no compensating advantages accrued. Most satisfactory departures from the old practice were made with the double engine rollers of 1887 and 1892. The introduction of double engines with crank at an angle of 45°, flanged steel yoke embracing the forward wheels, a proper distribution of the weight throughout the entire construction rather than concentrating it entirely in the wheels, jacketing of the steam cylinders and steam chests, dispensing with exposed steam pipe, were all conducive to quiet running, prolonged life of the gearing, easier manipulation of the machine and economy in fuel consumption. The advantage obtained by the double cylinders in maintaining slow speed made it especially applicable for plowing purposes, necessary in breaking up old roadways. This machine was in many respects a departure from beaten paths.

The repairs on rollers built by this company since 1887 and now in active use cost, in 1893, about \$10 for each machine per annum.

THE WESTINGHOUSE STOPPER INCANDESCENT LAMP is the subject of a catalogue by the Westinghouse Electric & Mfg. Company of Pittsburgh, Pa. This lamp is made in two principal parts—the glass bulb and the stopper that fits into it. Leading in wires pass through the stopper and are put in when the stopper is molded. After the carbon is mounted upon the wires it is inserted in the bulb and the stopper put in place, then the sealing material is applied. The bulb has a pressed or molded neck, forming in itself the finished top of the lamp, doing away in standard fittings with brass or shell cap, thus simplifying and cheapening the cost of production. The successful substitution of iron for platinum leading in wires was accomplished first by this company. Lamps of this description were used for the incandescent lighting of the World's Fair.

MANUFACTURING.

Iron and Steel.

The annual meeting of the stockholders of the Sterling Steel Company of Pittsburgh, with works at Demmler, Pa., manufacturers of the Wheeler-Sterling projectiles, was held in the Westinghouse Building, Pittsburgh, last week. The present Board of Directors was re-elected and the board chose the old officers, as follows: C. Y. Wheeler, president; C. W. Mackey, vice-president; John S. Lyon, secretary; A. S. Beamer, treasurer. The directors are: John M. Hughes, New York; J. M. Roland, Franklin; A. S. Beamer, New York; C. W. Mackey and C. Y. Wheeler, Pittsburgh. The directors declared a dividend of 6 per cent., payable August 1. After the meeting of the stockholders and the directors a visit was made to the works at Demmler, Pa. The inspection of recent improvements in the work of further perfecting the manufacture of projectiles was highly pleasing to the directors, and the advancements will continue as before, under the direct supervision of President Wheeler.

Belmont Furnace of the Wheeling Steel & Iron Company, Wheeling, W. Va., which was banked down on account of the coal strike, has resumed operations.

At a recent meeting of the directors of the Faige Tube Company, at Warren, Ohio, C. B. McCrum was re-elected general manager and treasurer and J. T. Bray secretary and superintendent.

At the annual meeting of the stockholders of the Ohio Steel Company, held at Youngstown, Ohio, the following Board of Directors was elected: Gen. J. L. Botsford, L. E. Cochran, Henry Wick, M. C. Wick, J. B. Butler, Jr., E. L. Ford, E. L. Brown and James Parmelee. The board organized by electing the following officers: Henry Wick, president; J. G. Butler, Jr., vice-president, and W. H. Baldwin, secretary.

The Monongahela Iron & Steel Company, Hays Station, near Pittsburgh, Pa., manufacturers of high grade muck bar, are operating 20 puddling furnaces, six heats to a turn.

Last week some labor troubles cropped out at the blast furnace plant of the Carrie Furnace Company, at Rankin, Pa., near Pittsburgh. The second stack of the plant having been put in operation, a strike occurred among the ore handlers, who demanded that their wages be restored to the basis prevailing before the last reduction. This request was denied, with the result that the ore handlers and also some of the metal wheelers went out on strike, and it was found necessary to again bank down both the stacks. It is thought a settlement of the trouble, which is not of a serious nature, will be secured during this week.

The Cincinnati Corrugating Company started up their rolling mills at Piqua, Ohio, last week, causing much rejoicing among the idle workmen.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, have made application for a charter of incorporation, and will at once commence the erection of suitable buildings at Haselton, Ohio, for the manufacture of roofing. The incorporators are John O. Pew, Chas. E. Pew, L. E. Cochran, M. Evans and G. M. McKelvey. The company will use in the manufacture of their roofing a fastener invented by John O. Pew, who was formerly connected with the Niles Iron & Steel Roofing Company, Niles, Ohio. The new concern will buy sheets from the Andrews Brothers Company, whose plant is also located at Haselton. It is proposed to equip the new plant with the latest modern machinery for the manufacture of roofing.

The annual meeting of the Rome Merchant Iron Mill was held July 16, and the following officers elected for the ensuing year: Jim Stevens, president; Saml. B. Stevens, vice-president; Chas. W. Lee, secretary and treasurer. The Executive Committee consists of Jim Stevens, Chas. W. Lee and Saml. Southall.

It is the intention of the new Kansas City Car & Foundry Company to add a rolling mill to the plant which they are now building at Armourdale, near Kansas City, Mo. The works will first be laid out for the manufacture of car wheels and car and other castings.

Now that the rolling mills are about to be removed from Burlington, Iowa, to Tacoma, Wash., the Burlington people are appreciating their value. An effort is

being made to induce the owners not to remove the plant but merely to relocate it at a more advantageous point in Burlington for the receipt of materials. On its present site it has been burdened with switching charges, which absorbed all profits.

The wire nail department of the American Wire Nail Company, at Anderson, Ind., resumed operations for the coming year on the 19th inst., putting 400 men to work. Notice was also posted that the rod department of the works would resume operations on the following Monday.

At Milwaukee, on the 17th inst., the representatives of the Illinois Steel Company signed the scale of the Amalgamated Association, and on the next day the rolling mills at Bay View resumed operations, putting about 1300 men to work. The scale would have been signed sooner but for one slight hitch. There was a question as to whether the Illinois Steel Company were entitled to a reduction of 10 per cent. in the scale for the rolling and heating of skelp iron and steel. The reduction was finally conceded by the association. The company have not made much skelp iron or steel at the Bay View mills up to the present time, but now intend to engage in the manufacture of skelp steel at that point on quite a large scale, shipping the product to Chicago. With the exception of the price for rolling and heating skelp iron and steel the scale just signed is virtually the same as that of last year.

The plant of the W. Dewees Wood Company, McKeesport, Pa., manufacturers of patent planished sheet iron, was put in full operation on Monday morning, the 15th inst. How long the plant will be operated in this way depends entirely upon the receipt of orders.

The plant of the Canonsburg Iron & Steel Company, Canonsburg, Pa., manufacturers of fine sheet iron and sheet steel, was closed down on Saturday, June 30, for stock taking and repairs. It is expected the entire plant will resume operations about August 1 next, and the new tin mill recently erected by the firm will be put in operation at the same time.

The plant of Dilworth, Porter & Co., Limited, at Pittsburgh, manufacturers of railroad, street railway and boat spikes, is being operated to about two-thirds capacity.

The Reading Iron Company, Reading, Pa., are operating a part of their tube plant and also their other departments, with the exception of the rolling mill. It was expected to put the rolling mill departments in operation on Monday, July 23, but the dubious outlook in the bituminous coal region at the present time does not give much assurance of a supply of coal being received, and the starting up of this idle department has therefore been postponed.

For the first time in some months every department of the plant of the Linden Steel Company, at Pittsburgh, is in full operation, with the exception of the plate mill. This concern are just now turning out a large tonnage of open hearth steel billets and are finding a ready market for the same. They have recently made a shipment of 50 tons of floor plates, measuring $\frac{1}{2}$ inch thick, which will be used in the construction of gutters on some of the prominent streets in New Orleans, La.

Duquesne Tube Works Company of Pittsburgh, with works at Duquesne, Pa., have started up one lap weld furnace and are giving employment to about 240 men. The plant of this concern has been closed down for about a month.

The plant of the Paige Tube Company, Warren, Ohio, manufacturers of wrought iron pipe, is being operated to full capacity in all departments on double turn.

The annual meeting of the stockholders of the Ohio Iron & Steel Company, operating Mary Furnace, at Lowellville, Ohio, was held last week. The following board of directors was elected: Thomas H. Wells, John C. Wick, Fred H. Wick, and Robert Bentley of Youngstown; Samuel Mather of Cleveland, and Ibad. F. Woodman of Chicago. The board organized by electing the following officers: Thomas H. Wells, president; John C. Wick, vice-president; Fred H. Wick, treasurer, and Robert Bentley, general manager and secretary. It was decided to make some extensive improvements and additions to the blast furnace of this concern, and, it is stated, some \$40,000 will be spent in improvements. As already noted in these columns, three Kennedy-Cowper hot blast stoves, 18 x 75 feet in size,

will be erected, the contract having been let to Julian Kennedy of Pittsburgh. The stock house will also be enlarged and new scales will be added, while the yard tracks will be rearranged in such a manner that there will be quite a change in the present system. The improvements that will be made will increase the output of the furnace considerably. At present the capacity is about 175 tons, but it is hoped to increase this to 250 tons.

After long idleness for lack of soft coal, the Reading (Pa.) Iron Company's pipe mill will soon resume full handed.

The Andrews Brothers Company of Haselton, Ohio, will build another sheet mill, thus doubling their capacity in this department. They will also put in a cold rolling train.

It is stated that the Philadelphia Furnace, at Florence, Ala., is being put into condition preparatory to going into blast.

At a meeting held by the employees of the Columbia Iron Company of Columbia, Pa., it was decided not to return to work at the rolling mill for less than \$3 a ton unless the employees of the Susquehanna Rolling Mill accept the reduction to \$2.75 per ton. In that case the others will also return to work.

It is announced that the Seyfert Rolling Mill, at Gibraltar, Berks County, Pa., will resume operations this week, after a suspension of two months' duration.

It is reported from Lancaster, Pa., that James C. Donnelly of Altoona has leased the Eden Iron Works, which have been closed for several years, and will shortly put them in operation again.

Bellaire Furnace, at Steubenville, Ohio, closed for some time, on account of the miners' strike, will, it is stated, shortly resume operations.

It is stated that the litigation in which the various interests of the Maumee Rolling Mills, Toledo, Ohio, have been involved is to be terminated by the sale of the plant, lands and stock. The sale will probably take place at public auction on September 1.

C. Y. Wheeler, president of the Sterling Steel Company, McKeesport, Pa., is reported to have stated authoritatively that his company have no intention of entering into the manufacture of armor plate.

The New Haven, Conn., Rolling Mill has started up again, after six weeks' idleness, with a force of 150 men. The concern were obliged to shut down about June 1, being unable to get a supply of soft coal because of the strikes at the time.

The Longmead Iron Company of Conshohocken, Pa., capital \$100,000, have been formed and a charter applied for. The incorporators are Jawood Lukens, Albert L. Murphy, James E. Salter, Henry M. Tracey, Lewis N. Lukens. The company have purchased the rolling mill property of Jawood Lukens, in Conshohocken, and will commence at once the erection of an additional rolling mill 60 x 200 feet, for the manufacture of skelp or pipe iron.

It is reported from Coatesville, Pa., that Worth Brothers are considering the advisability of increasing the facilities of their plant by the erection of a new rolling mill.

Robesonia Furnace, at Robesonia, Pa., has resumed blast. Operations were suspended May 26 last on account of the coal strike and during the suspension a number of improvements were made.

The York Rolling Mill, at York, Pa., which closed down six weeks ago on account of the scarcity of coal, has again resumed operations.

Machinery.

The Montana Iron Works, at Butte City, Mon., are building a hoisting engine for the Colusa-Parrot mine, which is claimed to be the largest and finest piece of machinery thus far built between Denver and San Francisco. It will be equipped with Corliss valve gear, with improved releasing gear and noiseless dash pots, with improved vacuum valves. One of its strongest features will be that the engineer's levers will be so placed that the greatest distance apart the four operating levers can be placed will be 36 inches. The engineer can thus at all times reach any lever without looking for it, and can watch the cage at the same time. The engine will also be equipped with steam friction clutches and steam brakes, which are the invention of S. A. Worcester, the designer. This brake is very sensitive, and the operator can always accurately tell how

much pressure he applies. The automatic cut off will be operated by a governor of the Porter type. The size of the engine will be 16 x 30 feet and will have a capacity of working to the 2000-foot level. The average speed will be 120 revolutions of the 10-foot reel per minute, but the speed can be varied while the engine is in motion from 50 revolutions up. The engine will be capable of hoisting a cage at the rate of 1800 feet per minute.

The Rudolphi & Krummel Machine Works, 96-100 North Clinton street, Chicago, Ill., are making a specialty of designing and building rotary gang shears with adjustable cutters. They have recently shipped a shear for cutting and trimming sheets 168 inches wide and 1-32 inch thick. This tool is probably the largest one of its kind ever built. It was furnished with eight sets of cutters, arranged in such a way that strips as narrow as 10 inches could be cut. Necessarily a tool of this kind has to be more or less of a special nature, but in general rotary gang shears recommend themselves where large quantities of square or rectangular blanks have to be cut.

The John Rohan & Son Boiler Works Company have been incorporated at St. Louis, Mo., with a capital stock of \$10,000.

C. C. Quinn has sold his boiler works, at Mankato, Minn., to H. L. Green, F. H. Esterly and Edward Hill.

The Giesy Foundry & Machine Company have been incorporated at Salt Lake City, Utah, with a capital stock of \$10,000. Sidney W. Darke is president, James Moffat vice-president, Wm. S. Giesy secretary and Emery Ward treasurer.

The Buffalo Forge Company of Buffalo, N. Y., a short time ago installed for the Menasha Wooden Ware Company of Menasha, Wis., what is stated to be the largest full housing fan ever employed for a lumber dry kiln. The fan stands 150 feet in height and is supplied with a direct acting 10 x 10 inch cylinder engine, the working parts being entirely inclosed. A heater containing 14,000 lineal feet of 1-inch pipe is used in conjunction with this fan. Although this engine runs continuously, and upon a foundation anything but solid, highly satisfactory results are obtained. A duplicate of this plant has now been ordered by the same company.

The Silver King Mining Company of Salt Lake City, Utah, are erecting a repair shop at their Park City mines and have just contracted with the Lodge & Davis Machine Tool Company of Cincinnati, Ohio, for the entire equipment, including Standard engine lathes, planers, drill presses, shafting, pulleys, belting, &c.

Riter & Conley of Pittsburgh, manufacturers of heavy iron and steel work, are giving employment to about 160 men, and have some good sized orders on hand.

The Laird & Sweeney Mfg. Company of St. Johnsbury, Vt., recently shipped a 25-pound power hammer, designed to run 500 strokes per minute, to Billings & Spencer of Hartford. They also rent a 100 pound hammer to the Springfield Drop Forging Company of Brightwood, Mass., and are now building a 100-pound hammer for the Fairbanks Scale Works, to run 250 revolutions per minute, with 12-inch stroke.

The Walker & Pratt Mfg. Company of Watertown, Mass., have closed their foundry indefinitely, throwing 200 men out of employment.

The Harrison Safety Boiler Works of Germantown Junction, Philadelphia, have established an Eastern branch office, under the management of Sumner B. Merrick, at 19 Pearl street, Boston.

The plant of the Columbian Iron Works Company, at Baltimore, Md., has been damaged by fire to the extent of \$80,000.

The Rogers Foundry & Stove Company, Belleville, Ill., manufacturers of stoves and machinery castings, have made a voluntary assignment.

Harlan & Hollingsworth Company, Wilmington, Del., car and ship builders, will erect as additions to their plant a pattern and molding shop 63 x 254 feet, two stories high, of iron, to cost \$20,000, and a one-story frame blacksmith shop, 37 x 150 feet, to cost \$3000.

The directors of the Rome Locomotive & Machine Works, Rome, N. Y., have elected the following officers: President, Thomas H. Stryker; vice-president, Wm. B. Isham; secretary and treasurer, Edward Comstock. Executive Committee: Messrs. Stryker, Comstock and Isham. The work

of rebuilding the planned portion of the company's buildings is progressing satisfactorily, and will probably be completed this fall. Meantime the company are turning out different classes of machine work.

For the first time in the history of the firm, it is stated, the Davis & Furber Machine Company of North Andover, Mass., have been forced to reduce the wages of their employees.

The Rider Engine Works, at Walden, N. Y., have restored the 10 per cent. reduction made in wages last fall. They are pushed with orders.

Hardware.

The Sandwich Enterprise Company, Sandwich, Ill., are building an addition to their plant which will permit them to increase their output in the corn sheller line.

The Schultze Mfg. Company have decided to remove their plant and machinery from Philadelphia to Pottstown, Pa. A number of parties in the latter place have taken stock in the company, and the plant will be started up on a more extensive scale as soon as the stockholders select a building or site. The company are putting on the market the Schultze padlock and other specialties.

The Moore Mfg. Company, Milwaukee, Wis., are pushing the erection of a new plant.

The American Glue Company have been organized at Trenton, N. J., with a capital of \$11,000.

One of the buildings of the Hatch Cutlery Works, at South Milwaukee, Wis., was burned on the morning of the 16th inst., entailing a loss of about \$600, which was covered by insurance. The burned portion was a small frame building 25 x 30 feet, which was used for casting. The company's works will soon be removed to Buchanan, Mich.

The Clinton Wire Cloth Company, Clinton, Mass., have started the new compound engine in their weaving mill, recently erected. It runs 3000 feet of shafting and works with an initial pressure of 125 pounds. Looms are being placed in the new weave rooms. About 100 looms are now in position. They are being started as fast as erected. The weave rooms are 300 x 80 feet. Two of them will be used exclusively for weaving window screen cloth. The capacity of the company when the new looms are all running will exceed 70,000,000 square feet of wire window screen cloth per annum, which can be doubled by running nights.

A representative of the firm of Reynolds Bros., Cortland, N. Y., manufacturers of screen wire, is stated to be investigating the advantages of several Illinois towns with a view to removing their factory to a Western point.

The barb wire and wire nail factory of the Janesville Barb Wire Company, at Janesville, Wis., was burned on the 12th inst., entailing a loss of about \$8000, covered by insurance. The factory has not been running for some time and the stock on hand was small, the loss being largely on the machinery.

Arrangements are being made for the erection of a bicycle factory at New Castle, Ind., to manufacture a machine patented by Dr. J. Redding. A building will be put up, 100 x 50 feet, three stories high, stocked with the most improved machinery.

The plant of the Youngstown Stamping Company, Youngstown, Ohio, manufacturers of oil cans and tin specialties, is in operation to nearly full capacity. The firm have a fair amount of business on hand, but the outlook for the future is not as encouraging as desired.

The Illinois Pure Aluminum Company, Lemont, Ill., have resumed operations, 50 hands finding employment. The company have just received an order from the Bureau of Equipment of the Navy Department at Washington for a 60-gallon jacketed aluminum kettle for the cruiser "San Francisco."

The Arcade File Works, at Anderson, Ind., were put in operation on the 16th inst. for the coming year, and at the same time the new plant, an exact counterpart of the old, was put in operation for the first time. The plant is now claimed to be the largest of its kind in the United States. It employs 500 hands. The company is composed of Chicago capitalists. Samuel W.

Allerton is president and C. C. Clark secretary.

One hundred employees of the St. Louis Shovel Company, St. Louis, Mo., struck on Saturday, 21st inst., because of a reduction of 15 per cent. in wages.

The Hartman Mfg. Company of Ellwood City, Pa., manufacturers of Hartman wire specialties, advise us that the report that their mat department was closed down is without foundation. The concern state that they are in position to give orders for mats or fencing special and prompt attention at the present time.

Britten, Graham & Mathes of Pittsburgh, manufacturers of builders' hardware, have received the contract for the locks, knobs and hinges for the new Golden Eagle Hotel, at Sacramento, Cal.

Notwithstanding the dull times the New Britain Hardware Mfg. Company, New Britain, Conn., advise us that they have added materially to their machinery to enable them to produce goods more rapidly and more economically. The company give special attention to making special machine screws and also metal turning of all kinds. Bicycle parts, such as hubs, cones, cups and ball bearings, are turned from bars of steel made for this special work, and brass nipples from special nipple brass rods. Another department is devoted to the manufacture of special hardware in great variety, and the plant is fully equipped for this line of work.

Bissell Carpet Sweeper Company, Grand Rapids, Mich., are making preparations to start a factory at Toronto, Ont. The plant will soon be in a position to turn out carpet sweepers.

The plant of the Baker Chain & Wagon Iron Mfg. Company, Allegheny, Pa., which shut down some time since, resumed operations on Monday, 23d inst.

Miscellaneous.

The Youngstown Bridge Company, Youngstown, Ohio, manufacturers of iron and steel bridges and structural work, are just completing the steel work for the State Fair Exposition Building at Springfield, Ill., and for a two-span four track bridge on the B. & O. Railroad at Bessemer, Pa. The large girders in this bridge are 85 feet span and 8 feet 8 inches deep. This firm also have a contract for the Pope's Crossing bridge on the W. & C. B. Railway and the Black River drawbridge, Vicksburg, Miss.

The Advance Thresher & Engine Company of Battle Creek, Mich., have recently shipped 25 carloads of separators and engines to South Africa.

Riter & Conley of Pittsburgh have secured a contract for the erection of two iron tanks for the Water Department of Allegheny, Pa. They will measure 40 feet in diameter and 22 feet high. One is to rest on a stone and timber foundation and the other on a steel tower 28 feet high. The same firm have been at work for some time on the construction of 24 marine boilers, 8½ feet in diameter, for Philadelphia.

Last week the blast furnace, Bessemer steel plant, two plate mills and three furnaces and the galvanizing plant in the tube department of the Riverside Iron Works of Wheeling, W. Va., were in operation.

The Berlin Iron Bridge Company of East Berlin, Conn., have received a contract from the Delaware, Lackawanna & Western Railroad for one of their iron roofs to cover the new engine room at the Auchincloss shaft. This is the third roof of this kind bought by the company.

The plant of the Pittsburgh Locomotive & Car Works, Allegheny, Pa., was closed down on June 29 for repairs, but resumed operations on July 16. The new buildings for erecting and carpenter shops now being built by this concern are expected to be ready for occupancy about October 1 next.

The puddlers in the employ of Phillips, Nimick & Co., Limited, operating the Sligo Rolling Mills, at Pittsburgh, went out on a strike on Saturday, July 21, on account of the refusal of the firm to increase their wages from \$3.60 to \$4 per ton for boiling. The men also demand that the Amalgamated Association scale be signed. The firm, however, have been operating their plant non-union for some months past, and will not recognize labor organizations of any kind and will refuse to sign any wage scales.

The wire works of Howard & Morse, at Brooklyn, N. Y., have been damaged \$15,000 by fire.

The Iron and Metal Trades.

"Next week" is the best answer which the furnacemen in a number of districts can draw from the Connells-ville Coke operators, and is about as satisfactory as the exasperating *mañana* of some of our Spanish neighbors. It does look as though just cause for complaint does exist when consumers of Coke cannot get delivery of material for which they have actually paid in full months since, and yet see train after train of the coveted fuel roll by their idle plants.

While modest progress is being made in firing additional Coke ovens, the rate is distressingly slow. The scarcity of the fuel is the dominating factor in the Western Iron trade, and indirectly, of course, affects the Eastern producers. Some of the latter, being largely dependent upon the Connellsville region, suffer. Others are gainers, since the Western works are practically letting the Eastern markets alone.

The Eastern mills are therefore taking what current work is coming out, and the breathing spell they are enjoying gives their local markets an air of greater cheerfulness.

In the West the Pittsburgh and Chicago districts are pretty nearly taking care of the requirements of buyers, which on the whole are not great. The scarcity of raw material keeps Bessemer Pig Iron and Steel Billets pretty steady for early delivery, but buyers cover only what they must have. For later delivery or larger transactions buyers and sellers are still apart, although there is no talk of an early return to the days of \$15.25 and \$15.50 Soft Steel.

The movement among Southern furnaces which have long been idle to resume operations is somewhat puzzling. It is pretty well known that the best managed plant in the Birmingham district has stopped because there is no money in making iron, and yet these other concerns, known to be less advantageously equipped and supplied, are again getting ready for the fray.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., July 24, 1894.

So far as this market is concerned there seems to be a tendency toward improvement. The volume of business is somewhat larger, inquiries are more numerous, prices are fairly steady, and, moreover, orders in hand are larger than for some time past. It is too soon yet to say what the ultimate outcome will be, but the trade take an encouraging view of the situation, and unless swamped by offerings from the West the improving tendency ought to continue. The feeling is very nervous, however, and until the movement includes other sections of the country there will naturally be more or less hesitancy in believing that the reaction is to be permanent. Meanwhile prices along the entire line may be called steady to firm. Nothing can be had for less money than a week ago, and in some lines there is a perceptible stiffening, based, however, more on short supplies than on any special increase in the demand.

Pig Iron.—There is very little change to notice in this department. Prices are steady, but the demand has not been active enough to cause any further stiffening, notwithstanding the extremely light supply. Sellers appear to be in a strong position, nevertheless, and with a little more demand the inside quotations would probably have to be dropped. Alabama Irons are virtually out of the market, and with the recent advance in freights Western brands cannot be sold at the low figures recently quoted, so that local furnaces meet with less competition hereabouts, although they have to meet it at other points. The foundry trade is a good deal depressed, however, and some of the large concerns begin to doubt whether they will find any larger business than they did a year ago. The Mill trade is better than it was at that time, as shown by the relatively higher prices and scarcity of Bessemer, and prospects in that direction are quite favorable, but, as already stated, the Foundry business is very dull. The chief strength of the market arises from the light stocks, small output and higher cost of production, but from present appearances there is not likely to be any material change in prices, unless the demand assumes larger proportions than at present. There is a possibility in that direction, but for the time being the trade are inclined to follow conservative lines, taking what they need at current quotations, and leaving the future to take care of itself. General asking prices are about as follows for Philadelphia and near by points:

Bessemer.....	None offered.
Standard No. 1 Foundry X.....	\$12.50 @ \$13.00
Standard No. 2 Foundry X.....	11.50 @ 12.00
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00
Standard Gray Forge.....	10.50 @ 10.75
Ordinary.....	10.25 @ 10.50

Muck Bars.—There is more inquiry for Muck Bars, and it is not unlikely that they will be in better demand in the near future. Holders ask \$19.50 @ \$20, f.o.b. cars at their mills, with buyers at about 50¢ less.

Steel Billets.—The market is not active by any means, the high figures asked (\$19.50 @ \$19.75) being more than consumers can pay, considering the price they get for the product. Moreover, there are a good many Billets to come forward at \$1 @ \$2 per ton less money, and until these contracts are completed there is a natural unwillingness to buy new stock at higher prices.

Finished Material.—The improvement noted in recent reports appears to be maintained, although competition is close enough to prevent any further stiffening in prices. Mills are gradually accumulating orders, however, and most of those that are in operation are running fuller than they have at any time within a year past. Others that have been idle for some time are about starting up, so that it is hardly likely that prices will improve until there is a heavier demand than indicated by the present outlook. Some increase appears to be pending, but not to an extent to warrant any large increase in the productive capacity which is now in operation. Small orders come in rapidly, and it is this class of trade that has been the main stay of the market for a long time past. There will be 2500 to 3000 tons of bridge work given out in course of the week for city delivery, but apart from that there is nothing but the regular run of small orders, for which prices are about as follows:

Grooved Skelp.....	1.25¢ @ 1.30¢
Standard Refined Bars.....	1.30¢ @ 1.40¢
Medium quality.....	1.20¢ @ 1.25¢
Tank Steel.....	1.35¢ @ 1.45¢
Heavy Plates.....	1.30¢ @ 1.40¢
Shell.....	1.50¢ @ 1.60¢
Flange.....	1.60¢ @ 1.80¢
Angles.....	1.40¢ @ 1.50¢
Beams and Channels.....	1.50¢ @ 1.60¢

Old Material.—Demand improving but no change in prices, as the supply is ample for current requirements. Sales at about the following prices, delivered:

Heavy Melting Steel.....	\$10.00 @ \$10.50
Light Melting Steel.....	8.00 @ 8.50
No. 1 Wrought Scrap.....	10.50 @ 11.00
Machinery Cast.....	9.50 @ 10.00
Wrought Turnings.....	8.00 @ 8.50
Cast Borings.....	6.25 @ 6.75
Old Iron Rails.....	11.50 @ 12.00
Old Car Wheels.....	9.50 @ 10.00

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, July 25, 1894.

Taking a general view of the situation, the condition of business shows considerable improvement since the termination of the railroad strike, but a great deal still remains to be gained until matters are in as good shape as before the strike, although they were undoubtedly bad enough then.

Pig Iron.—Dealers in local Coke Iron report only limited sales and very light inquiries. Large consumers who have not yet covered their season's requirements are postponing negotiations until labor troubles have been completely settled and perhaps until the tariff agitation is ended. Almost nothing is doing in Southern Coke Iron and Lake Superior Charcoal. The condition is indeed one of midsummer dullness. Shipments are still interfered with by the irregular movement of freight on some railroads. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$14.50 @ \$15.50
Local Coke Foundry, No. 1.....	10.75 @ 11.00
Local Coke Foundry, No. 2.....	10.00 @ 10.50
Local Coke Foundry, No. 3.....	9.50 @ 10.00
Local Scotch.....	10.75 @ 11.00
Ohio Strong Softeners No. 1.....	13.00 @ 13.50
Southern Silvery, No. 1..... @
Southern Silvery, No. 2..... @
Southern Coke, No. 2.....	..... @ 10.75
Southern Coke, No. 3.....	..... @ 10.50
Southern, No. 1 Soft.....	..... @ 10.75
Southern, No. 2 Soft.....	..... @ 10.50
Tennessee Charcoal, No. 1..... @
Tennessee Charcoal, No. 2..... @
Alabama Car Wheel.....	17.50 @ 18.00
Jackson County Silvery.....	15.00 @ 16.00
Coke Bessemer.....	11.25 @ 11.50
Malleable Bessemer.....	11.75 @ 12.00
Other Ohio Silvery.....	14.00 @ 14.50

Bars.—Considerable more business is now being done than was reported

for the previous week. Some demand is coming from railroad companies, who are obliged to do a great deal of repairing. Several contracts have also been placed for delivery over the next three months by manufacturing consumers. Season contracting continues. Discrimination is being made by some season buyers in favor of the large mills, even if they have to pay a little higher price. They are not disposed to take the chance of failure to make delivery and being obliged to pay considerably higher when they get very busy. The outlook seems to be considerably better than for a month or more, as inquiries are so much more numerous and orders are increasing. Prices are maintained, about 1.10¢ @ 1.12½¢ for Common Iron from Old Rail mixture and 1.20¢ for guaranteed Iron. Soft Steel Bars from strictly Billet stock are firmly held at 1.30¢ @ 1.35¢. Small lots from store are quoted at 1.25¢ upward for Iron and 1.40¢ upward for Soft Steel Bars, but a little weakness is apparent in this class of trade.

Structural Material.—Matters are quiet. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Tees, 1.65¢; Angles, 1.45¢; Universal Plates, 1.45¢. Small lots from stock sell at 1.90¢ @ 2.25¢ for Beams and Channels; 1.50¢ @ 1.60¢ for Angles, and 1.70¢ @ 1.80¢ for Tees.

Plates.—Very little is doing in the way of mill shipments or in the sale of small lots from stock. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.45¢ @ 1.55¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.65¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, in carloads, 70 % @ 75 % off.

Sheets.—The inquiry is much better for both Black and Galvanized Sheets from general consumers. Jobbers seem to have covered their requirements for the present, but the miscellaneous trade is coming forward in better shape. Mill shipments of No. 27 Common are quoted at 2.40¢ @ 2.45¢, Chicago, No. 27 Soft Steel at 2.50¢ @ 2.55¢, and Galvanized Sheets 77½ and 5 % off. Lake Copper, 14¢, with no discount. Small lots from stock are quoted at 2.70¢ @ 2.75¢ on No. 27 Common; 3.30¢ on Wood's Smooth Iron, and 15¢ @ 100 less for factory shipment for delivery on or before September 1. Small lots of Galvanized Sheets are quoted at 75 and 5 %

Merchant Steel.—A great deal of season contracting has been done up to this time, but there are a number of large concerns which have not come into the market. The smaller establishments have been buying most freely, but in few cases have they taken as much as they did last year. General consumers have purchased to some extent during the past week. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.65¢ @ 1.75¢; Smooth Finished Tire, 1.60¢ @ 1.70¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.50¢ @ 1.55¢; Bessemer Tire, 1.40¢ @ 1.45¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Billets and Rods.—Consumers of Billets are making inquiries which would net a handsome tonnage if local manufacturers were in a position to guarantee deliveries. At present they are not certain when they will be able to ship, as the works are still shut down.

Nominal quotations are continued at \$18.25 @ \$18.50. Some sales of Wire Rods have been made and the market is firm at \$25.25.

Rails and Track Supplies.—Sales of Steel Rails have aggregated about 5000 tons since last report. The largest sale was one of 2000 tons. This shows the character of present orders. The heaviest inquiry now in the market is one for 5000 tons, but small orders are coming in so freely that they promise to develop into a satisfactory aggregate. The local mills are still closed, but will be started at an early day. Fair sales have been made of Splices and other Track Material, and inquiries are received for additional lots. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.25¢ @ 1.35¢; Track Bolts, with Nuts, 2.10¢ @ 2.15¢; Spikes, 1.75¢ @ 1.80¢; Links and Pins, 1.65¢ @ 1.70¢.

Old Rails and Car Wheels.—Old Iron Rails appear to be scarce and are held a little more firmly. Railroads are asking \$11, but no sales are reported. Old Steel Rails are in demand from Pittsburgh buyers, who offer \$7.75, Chicago, for mixed lengths for remelting. Selected long lengths of Old Steel Rails are worth about \$9.50 @ \$10. Old Car Wheels are quiet, with quotations continued at \$10 @ \$10.50.

Scrap.—It is difficult to learn of any business whatever. The local consumers are either well supplied or their works are shut down. Dealers quote the following selling prices @ net ton: Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Iron and Steel Axles, \$12.75 @ \$13; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.50.

Metals.—Copper is flat, with 9¼¢ asked for carload lots of Lake, and 9¢ for casting brands. Very little is doing in Spelter, which is still quoted at 3.25¢ in carload lots. Manufacturers report a continued good demand for Pig Lead, but they are holding fast to their stock on the chance that the tariff bill is dead. Last week Desilverized was sold at 3.20¢ for which the buyers would now refuse 3.40¢.

Louisville.

LOUISVILLE, KY., July 23, 1894.

The demand for Iron continues quiet. Buyers are not willing to pay any advance, and will purchase only for short delivery. The reports of contracts made for Ohio and Illinois Iron extending into next year at present prices, also the willingness of Coke companies to contract for long periods at prices very close to those prevailing before the strike, lead buyers to believe that there will be no advance of moment. Furnaces, however, will not sell for long deliveries at present prices, and believe the fact that so many furnaces in the North have gone on to Bessemer Irons will cause prices to rule firm and enable them shortly to obtain more money for Iron than at present. It is not believed that Chicago furnaces can produce Soft Iron that will take the place of that shipped from the South, and they are feeling little disturbed over the reports of sales of Soft grades made from Northern Ores by Illinois furnaces. At present the output continues small, owing to the labor troubles, and the current demand for Silvery

grades and Nos. 1 and 2 Soft is in excess of the supply. Several furnaces in the South that have been out of blast contemplate going in, among them the Middlesborough, Embreeville, and furnaces in the Sheffield district. The Irons made in the latter district are especially liked for their fluidity, and the furnaces will have no trouble in placing their product if they can compete with the ruling market for similar grades in the Birmingham territory. Their ability to ship by river also gives them some advantages, especially for St. Louis and Western territory. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry.	\$10.00 @	\$10.50
Southern Coke, No. 2 Foundry.	9.25 @	9.50
Southern Coke, No. 3 Foundry.	8.75 @	9.00
Southern Coke, Gray Forge.	8.50 @	8.75
Southern Charcoal, No. 1 Foundry.	12.50 @	13.50
Southern Car Wheel.	15.00 @	15.50

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, July 25, 1894.

Pig Iron.—There is a trifle more activity in the market, although as yet it has only resulted in sales of moderate size. The railroad situation is now in its normal condition and shipments are being received with the old time regularity. Indications point to a gradual increase in the demand as manufacturers are working more steadily and are gradually increasing their output. The constant decrease in the amount of Iron on the furnace banks leads many to believe that there will be a scarcity before the year is out. At this writing No. 1 Soft and No. 2 Foundry are difficult to obtain, and prompt shipment is only secured at full prices. No. 2 Foundry is quoted at \$10.50 @ \$10.75, f.o.b. cars, St. Louis, and there is no great urgency to sell at these figures. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.	\$11.00 @	\$11.25
Southern Coke, No. 2 Foundry.	10.50 @	10.75
Southern Coke, No. 3 Foundry.	9.75 @	10.00
Gray Forge.	9.50 @	9.75
Southern Car Wheel.	16.50 @	17.00
Ohio Softeners.	14.00 @	14.50

Bar Iron.—The improvement noted last week continues and while there is no change in prices to report there is more apparent strength to the market than there has been for months. Jobbers are in receipt of a goodly number of small orders which in the aggregate make a good showing. Mills quote 1.15¢ @ 1.20¢ for carload lots, f.o.b. cars East St. Louis. Jobbers ask 1.30¢ @ 1.35¢, according to quantity.

Barb Wire.—Manufacturers are not urging the sale of their product and jobbers report only a fair trade. Prices are unchanged as follows: Painted in carload lots, \$1.90, with 40¢ @ hundred-weight additional for Galvanized.

Wire Nails.—The demand for Wire Nails is not heavy but prices are well maintained. Mills quote \$1.20 @ \$1.25 for carload lots from mill.

Rails and Track Supplies.—An occasional order for Light Rails is received, but on the heavier sections there is nothing doing. Old Iron Rails are in better demand and \$10 @ \$10.50 is the ruling quotation. Track Supplies are quoted as follows: Splice Bars, 1.30¢ @ 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢; with Hexagon Nuts, 2.10¢; Steel Links and Pins, 1.60¢; Iron, 1.70¢; Steel Rails, \$26 @ \$27.

Pig Lead.—This metal continues to show additional strength and sales have been made at 3.25¢. At the close to-day offerings were extremely limited at 3.22½¢, with plenty of bids at 3.20¢.

Spelter.—In sympathy with Pig Lead, Spelter is held firmly at 3.20¢, but very little trade is doing. The market shows considerable strength and higher prices are predicted.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }
Pittsburgh, July 24, 1894. }

The situation continues to be dominated by the Coke strike. While Pittsburgh furnaces are nearly all in blast, the appeals of furnacemen in the two valleys for enough Coke to start them up are unheeded and much dissatisfaction exists. While it has always been the policy of the leading Coke concern to take care of the identified interest when a scarcity of Coke from any cause exists, yet, at the same time it has been hinted that partiality has lately been shown in favor of furnaces that would agree to trade iron for Coke. The situation in the Coke region shows some improvement in the last few days, and hopes of furnacemen that they will soon be able to get fuel have been strengthened considerably. The situation in general shows a little improvement as far as operation of the mills is concerned, and there are many who believe that we will have a good fall trade with a possibility of present prices being maintained, while on some lines advances may be secured.

Pig Iron.—The market continues bare of large transactions, while sales of small lots for close delivery are more plentiful. None of the Valley furnaces are in position to take contracts just now, except with the condition of "shipment after settlement of the Coke strike," and as this term is rather vague, buyers are holding off and furnacemen are not pushing the market. For prompt delivery Bessemer is ruling at \$12.25, Pittsburgh, and in some cases \$12.50 is asked. Gray Forge is in better demand, and is firm on the basis of \$10, Pittsburgh. The few transactions going in Foundry Iron are for small lots of 50 and 100 tons and prices are unchanged. The slight labor trouble at the Carrie Furnace plant has been adjusted, the men withdrawing their demands. In the Pittsburgh district only six furnaces are idle at this time, these being one Edgar Thomson, one Isabella, one Eliza, one Shoenberger, one Monongahela and Soho. For forward delivery we quote as follows:

Neutral Gray Forge.....	\$9.85 @	\$10.00, cash
All-Ore Mill.....	9.75 @	10.00 "
No. 1 Foundry.....	11.75 @	12.00 "
No. 2 Foundry.....	10.75 @	11.00 "
Bessemer.....	11.75 @	12.00 "

We note a sale of 500 tons of Bessemer for July delivery at \$12.25, Pittsburgh.

Billets.—Inquiries for Steel are more numerous, but prices quoted by makers for delivery during the next three or four months do not seem to meet the views of buyers, and the market is a waiting one. The continued scarcity of Pig Iron, due solely to the Coke strike, prevents anything like full operation among the Steel mills, and while this continues there does not seem to be much fear of a material decline in prices. We are advised of a number of transactions in Billets for close delivery at prices equal to about \$18 at makers' mill. For delivery during August,

September and October \$17.25 up to \$17.50 are the quotations, but buyers contend that these prices are too high, and are holding off.

Ferromanganese.—We continue to quote at \$53, delivered, for 80 % domestic.

Structural Material.—Very little large work is in sight, but there is a fair demand for small lots, which, in connection with orders booked some time ago, serves to keep the two local mills well employed. We quote as follows: Beams and Channels in round lots, 1.25¢ at mill. In small lots, 1.30¢ @ 1.40¢, according to order. We quote Angles and Universal Plates at 1.20¢ @ 1.35¢, according to order, and Tees 1.35¢ @ 1.40¢.

Plates.—The demand is wholly for small lots, but prices continue to show a firmer tendency, due largely to the high prices ruling for Pig Iron for prompt delivery. We quote as follows: Tank Steel, at 1.25¢ @ 1.30¢; Shell, 1.40¢; Flange, 1.45¢; Ordinary Fire Box, 2½¢ @ 3¢; Railroad Fire Box, 3.35¢ @ 3.50¢, depending on size of the order.

Merchant Steel.—There is a fair run of small orders and some season contracts are in the market. Mills, however, are generally declining to quote for extended delivery, on account of the low prices ruling. We quote as follows: Bessemer Machinery, 1.30¢ @ 1.35¢; Open Hearth Spring, 1.65¢ @ 1.70¢; Open Hearth Machinery, 1.45¢ @ 1.55¢; Machine Straightened Tire, 1.60¢ @ 1.65¢; Cold Rolled Shafting, 2.30¢ @ 2.35¢; Tool Steel, 5¢ @ 7¢ for ordinary grades; 11¢ @ 13¢ for extra grades.

Rails.—The local mill is running this week on an order for 10,000 tons of Blooms for shipment to a concern in Western Pennsylvania.

Muck Bars.—The demand is light, and we continue to quote \$19.50 @ \$19.75 for best grades, delivered at buyer's mill.

Bars.—Business seems to be a little better, some of the Valley mills reporting quite an increase in inquiries during the last week or ten days. With an improved demand, makers state that prices must surely improve and already are showing a better tone. Valley mills are holding for 1.05¢ at mill, half extras. Steel Bars of all Billet stock are held at 1.15¢ with Bar Iron extras.

Wire Rods.—Some heavy inquiries for Rods have come into the market within the last few days, and while buyers and sellers are somewhat apart in their views, there is a good prospect of some business being closed shortly.

Sheets.—The demand continues fairly large, but mills continue to have more or less difficulty in getting Billets as fast as needed. We quote No. 27 Common Iron at 2.30¢ @ 2.35¢ with 10¢ additional for Steel. Galvanized Sheets are ruling at 75 and 10 % discount.

Wire Nails.—The mills are nearly all closed and some of them will remain idle until well on in August. For this season of the year the demand is fairly satisfactory and prices are firm at \$1.15 for carload lots at mill. The Cut Nail market shows no new features, and we quote at 95¢ @ \$1 in carload lots, at mill, for the usual averages.

Barb Wire.—The demand is extremely light and most of the mills are off altogether or running only in part. We quote Four-Point Galvanized at \$2.05 @ \$2.10, and Plain at \$1.40 in carload lots at mill.

Iron and Steel Skelp.—An order for some 700 tons of Grooved Steel Skelp, for close delivery, was placed here last week. We continue previous quotations as follows: Grooved Steel Skelp, 1.10¢ @ 1.15¢; Sheared Steel Skelp, 1.20¢ @ 1.25¢; Grooved Iron Skelp, 1.20¢ @ 1.30¢; Sheared Iron Skelp, 1.35¢ @ 1.40¢.

Pipes and Tubes.—There are no new conditions to report, the demand holding up very well and prices being well sustained. The plant of the National Tube Works Company is in operation again to nearly full capacity, while the Duquesne Tube Works Company have also resumed.

Connellsville Coke.—The situation in the Connellsville region is reported as considerably improved during the past few days, the cooler weather allowing the new men to get out an increased output. A few of the old men return to work each day, but desertions of the negroes are of daily occurrence. While the situation at present is more favorable than for some time, a return of warm weather would probably cause large numbers of negroes to give up their positions, as they seem unable to stand the heat.

Birmingham.

BIRMINGHAM, July 23, 1894.

The ignominious attack last Monday upon the working miners by a body of strikers had a demoralizing effect on the former, especially the colored portion of them, which temporarily resulted in a reduced output of Coal. But since the strikers have by their atrocious action lost the last remnant of sympathy among the best citizens, it is hoped that they will give up the fight, which was a hopeless one from the beginning. The railroad strike as far as its effect on Birmingham is concerned is over, trains are running with their usual regularity. More than 100 of the striking miners have been arrested and are lodged in jail here, all charged with murder. It is claimed that there is very strong evidence against the great majority of them. The ringleader, one by the name of Kelso, an ex-miner and store keeper at Pratt City, is among the number, and it is more than likely that he will lead no more strikes this side of eternity.

No. 2 Furnace of the Sloss Iron & Steel Company was to have blown in to day, but it had to be postponed another week or ten days, the Coal output still being a trifle short. This company are now mining about 1800 tons of Coal daily, leaving them still 300 to 500 tons short of what would be required to run two furnaces and fill their contracts for Coal.

Hattie Ensley Furnace, at Sheffield, has been leased by the J. W. Salsberry Furnace Company, and will be blown in early in August. It is to be run on brown Ore and Horse Creek Coke. It is claimed that the Iron to be made is already sold several months ahead.

There are also some prospects that the Vanderbilt Furnace will be put in repair and blown in early this fall. There will be several months' work required to put the furnace in order before it can be blown in. The repairs will probably be begun early next month.

There is every indication that just as soon as the labor troubles are settled business will at once revive, and regarding indignation meetings and strong resolutions condemning in the severest

terms all acts of intimidation and lawlessness, the citizens of Birmingham are doing their full duty. A number of semi-military companies have also been formed ready to aid the authorities on call. All this shows the temper of the people, and there is no doubt it will have its effect on the strikers.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, July 25, 1894.

There has been an undertone of confidence in the market for Southern Pig Iron during the week, under light offerings and a good jobbing demand, with sales to the extent of the offerings, chiefly in single carloads, and mainly of No. 2 Foundry and No. 1 Soft at \$7.50 per ton, f.o.b. Birmingham, or on that basis. Gray Forge Iron is scarce and wanted, so that it is probable that it could be sold on the basis of \$6.75, f.o.b. Birmingham. Mottled Coke has been sold in advance of production and is merely nominal. There are inquiries for lots of 5000 and 6000 tons of Foundry grades for Eastern shipment, but there seems to be no one disposed to sell in advance of production while the tariff bill is pending. If it could be settled beyond dispute in some way, it is believed that the Iron trade would revive, and if not in a way that would be profitable, yet anything is better than the prevailing uncertainty. The railroads are now making more prompt shipments and deliveries on old contracts are more satisfactory. In the present unsettled condition of the trade no change in quotations is justified, but it does not seem improbable that higher prices may soon be obtained. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$10.25 @	\$10.50
Southern Coke, No. 2.....	9.50 @	9.75
Southern Coke, No. 3.....	9.25 @	9.50
Ohio Soft Stone Coal, No. 1.....	14.50 @	15.50
Ohio Soft Stone Coal, No. 2.....	14.00 @	14.50
Lake Superior Coke, No. 1.....	12.50 @	13.00
Lake Superior Coke, No. 2.....	11.50 @	12.00
Hanging Rock Charcoal, No. 1.....	16.00 @	17.00
Hanging Rock Charcoal, No. 2.....	15.50 @	16.00
Tennessee Charcoal, No. 1.....	13.00 @	13.50
Tennessee Charcoal, No. 2.....	12.00 @	12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	16.25 @	17.00
Lake Superior Car Wheel and Malleable.....	16.25 @	16.75

Forge.

Gray Forge.....	8.75 @	9.00
Mottled Coke.....	8.50 @	8.75

Financial.

The financial situation shows no improvement for the week under review. The tariff is still unsettled and business remains in a condition of partial paralysis. Shipments of gold to Europe have been resumed in heavy volume and the Treasury's reserve of the metal has shrunk down to the lowest point touched since the resumption of specie payments. In view of these circumstances the outlook for business in the immediate future cannot be regarded as bright. The whole of the commercial and financial interests of the country must remain in a state of suspense until it is definitely known what is to be the fate of the tariff bill. Revival of business activity appears to depend entirely on the termination of the existing uncertainty in regard to that measure. Yet the whole question appears to have been thrown back into the old condition of confusion by the disagreement of the Conference Committee, and no one can tell just what or when the

end will be. The general desire of the business community is that this vexed question shall be settled one way or the other. This sentiment was voiced by a great petition forwarded last week to the Senate and House from Chicago, signed by bankers and business men of all shades of political opinion, demanding a speedy disposal of the tariff matter, irrespective of the character of the decision. Relief from the suspense is what is urgently needed and called for.

Gold exports to Europe have again caused a serious drain on the Treasury reserve of the metal. Last week the shipments amounted to \$3,300,000, and, although only \$1,250,000 have been sent abroad this week so far—\$1,000,000 to Europe and \$250,000 to Canada—the strength of sterling exchange gives foreign houses reason to expect that before the close of the week at least \$3,000,000 more gold, and probably a larger amount, will be shipped, unless the conditions change materially within the next few days. The last withdrawals for export have carried the Treasury gold reserve down to \$60,000,000. The recent drain on the gold reserve since its reinforcement by the \$50,000,000 loan in February has been extraordinary. At that time—February 10—the reserve stood at \$104,000,000; on March 10, \$107,000,000; April 10, \$105,000,000; May 10, \$92,000,000; June 10, \$69,000,000; July 10, \$64,000,000. If the New York banks had not supplied the Treasury with about \$10,000,000 of gold for export a few weeks ago, the gold reserve would now be down to \$50,000,000. The Treasury officials, however, still profess to believe that no additional bond issue will be necessary, and appear to rely on further aid from the New York banks in the event of distress. Meanwhile the receipts of gold from internal revenue and customs are unusually small, and no relief is experienced in this direction. The general Treasury balance, however, has shown a gratifying increase since the beginning of the month. It now stands at \$114,600,000, or more than \$8,000,000 above the figures of June 30.

The stagnation in general business is illustrated by the continued flow of money from the interior into the vaults of the New York banks. Saturday's statement showed a further increase in the surplus of reserve amounting to \$172,225, which makes the surplus above legal requirements \$74,014,600. One year ago, in the panic, the surplus reserve stood at \$1,256,550. Loanable funds continue abundant. Call money is still quoted at 1%, while time loans are freely offered by banks and trust companies on good collateral at unchanged rates, namely: 1% for 30 days, 1½% for 60 days, 2% @ 2½% for 90 days and four months, and 3% for five to seven months. The demand is, however, very slow. Mercantile paper is somewhat dull, owing to the dearth of good material. Rates are 3% for indorsed bills, 3% @ 3½% for high grade single names and 4% @ 5% for others.

During the greater part of the week up to last Saturday, speculation on the Stock Exchange was almost at a standstill, save for some active dealings in the manipulated industrial specialties, Sugar and Whisky undergoing some considerable fluctuations, and selling of St. Paul shares on Friday on rumors of a heavy decline in the July earnings of that road. Monday, however, was marked by greater activity. The dealings in Sugar again predominated, reaching the enormous total of 112,000

shares, with a jump of nearly 4 points on favorable Washington news. National Lead also took a small spurt, and advanced 1½ points. St. Paul and Missouri Pacific were sold down 1½ points each, the former on the publication of July earnings, showing a decrease, compared with a year ago, of 50%, and the latter on unfavorable rumors in regard to the financial conduct of the road. Atchison's shares were heavily sold by London after the announcement, on Saturday, that Expert Accountant Little had discovered that heavy rebates, amounting to \$7,000,000, from 1889 to 1893, which ought to have been charged to operating expenses, were not included in the books kept at the Western offices of road. Wheat touched the lowest price on record on Monday, scoring 55½¢ per bushel for September, and 59½¢ for December. The continued liquidation in the grain led to a selling movement in the granger stocks, which closed weak. Tuesday's market showed a marked reaction from that of Monday, and closed dull and heavy. The railroad bond market has been irregular and rather quiet. Atchison bonds and Missouri Pacific first collateral mortgage 5% bonds both experienced a sharp decline on active selling. Government bonds have been firm and quiet. The closing quotations were as follows:

	Bid.	Asked.
2's, 1891, registered.....	96	.....
4's, registered.....	114	114½
4's, coupon.....	114½	114½
5's, registered.....	117½	118½
5's, coupon.....	119	119½

The market for sterling exchange has been strong on account of the scarcity of bills and the increased demand caused by sales of securities for London account. The situation of exchange has been the cause of the recent gold exports, and the amount of gold to be shipped on Saturday will depend largely on the amount of London selling during the next few days. Actual business was done on Wednesday at \$4.87½ for 60 days, \$4.88½ for demand, \$4.88½ for cables, and \$4.86½ for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial par, bank 75 premium; Savannah, buying par, selling ½ premium; Boston par @ 3¢ premium; Charleston, buying at par, selling ½ premium; San Francisco, sight 10, telegraph 15; Chicago, 20¢ @ 25¢ premium; St. Louis, 50 discount.

Bar silver has advanced during the week to 28½ pence per ounce in London, and 62½¢, nominal, in New York. Shipments of the metal to Europe during the week have amounted to over 600,000 ounces.

Total bank clearings of all the clearing houses of the United States for last week were \$810,860,653, against \$852,934,628 in the former week, and \$955,055,730 the corresponding week last year, a decline of 15 1%, against a decline of 14% made the week before last week over the corresponding week in 1893.

The exhibit of railroad earnings for the month of May is the most unfavorable the *Financial Chronicle* has ever printed. The gross earnings of 141 roads for the month are \$49,226,912, showing a decrease of \$11,935,834 as compared with the same month last year. The net are \$12,253,187, showing a decrease of \$6,253,373. The exhibit of 140 roads, in gross, from January 1 to May 31, amounted to \$240,937,789, showing a decrease of \$47,623,274 for the first five months of the year;

net, \$63,243,443, showing a decrease of \$16,263,260. The effects of the railroad strikes are clearly shown in the statements of earnings for the weeks of July. The reports of 67 roads for the first week show a decrease of 30.39%. The enormity of the losses entailed on the roads directly affected is illustrated in the statement that the Northern Pacific's earnings for the first two weeks of July were only \$24,647, against \$787,825 in the corresponding two weeks of 1893.

Metal Market.

Pig Tin.—Steady additions to the spot supply have had more or less weight upon the market. A downward course to London prices has been something of a depressing feature. Besides, there has been a quiet contest in which the supposed supporters of the market have been outgeneraled, and, upon the whole, the market has had a more or less ragged appearance throughout the week. Prompt delivery went as low as 18.80¢, net cash, for 5-ton lots, and small parcels out of store were placed relatively as cheap. Futures commanded hardly the average premium. On Wednesday there were offers at 18.80¢ for July delivery.

Copper.—Dealings have been on a moderate scale and the demand is without visible improvement. In short, there is little doing outside of making deliveries on old contracts; but, in the absence of any pressure to sell, prices remain quite steady. The moderate business effected was chiefly at about 9.10¢ @ 9.15¢ for Lake Superior, 8½¢ @ 8½¢ for Electrolytic and 8½¢ @ 8½¢ for common casting stock. W. T. Sargent & Sons of London, in a recent report, say: The statistical position of Copper is one of unusual interest. It is just 12 months ago that the disturbed state of American trade showed itself distinctly in the utter inability of the United States to consume the metal at anything like the old rate, and from July 1 to December 31, 1893, it supplied Europe with 57,425 tons Copper, against 16,901 in the same months of 1892. During the last six months, say from January 1 to June 30, 1894, it has further supplied 37,394 tons, against 19,989 tons in the same months of 1893. This increase of 59,959 tons in 12 months has been followed by an increase in our visible supplies of 117 tons. In other words, Europe would have been starved out had this surplus not have been received. Shall we receive a similar surplus in the 12 months now ensuing? At present the probabilities are greatly against it. There is not the same pressure to sell on American account in Europe, and the reports point to a moderate and steady revival of demand in America. The producers there, seeing how entirely they hold the key to the situation, might determine to lessen the output, which is at present going on at the fullest possible rate. The present situation seems, then, to indicate that, with the continuance of a large production and small consumption in America, the surplus will not add to our visible supplies in Europe, but that we are liable to the double contingency of a larger consumption and smaller production in America that would force the demand heavily on to the European reserves. What justification, therefore, is there for Copper remaining at the present level of intense depression? Our price to-day is £10 3/4 ton below the average of the last ten years, whereas we have facing us eventualities

that might amply justify prices £10 3/4 ton above such an average. We never remember a position so clearly justifying holders in nursing their stocks in expectation of a demand from consumers to clear them out of it at higher rates.

Spelter.—Little change has taken place in prices and the demand is without visible improvement, but sellers offer with more or less reserve in view of moderate output at the present time. Quotations remain at about 3 50¢ @ 3 55¢ for ordinary Western brands.

Pig Lead.—There have been sales of single carload lots at as high as 3 70¢ on the spot and 3 60¢ for immediate shipment from the West, while prices on August and later shipments have hardened to the extent of 0.05¢ @ 0.10¢. The dealings make a modest showing all told, and the demand was at no time very spirited. In fact, light spot supplies, along with tariff probabilities, have been largely the cause of the movement in prices.

Antimony.—The market remains quiet, with prices largely steady at 8½¢ for Hallett's and 10¢ for Cookson's, in round lots.

Nickel.—Sales have been made of moderate quantities at 40¢ @ 42¢, and the market is rather easy.

Tin Plate.—Hardly any improvement has taken place in purchases of spot stock or in orders for future shipments and the market still has a rather dull appearance. Prices are barely steady, with the following quoted for spot stock: Charcoal, Melyn grade, IC, \$6; do., Melyn grade, Crosses, \$7.75; do., Allaway grade, IC, \$5.40; do., Allaway grade, Crosses, \$6.45; do., Grange grade, IC, \$5.50; do., Grange grade, Crosses, \$6.60; do., Terne, M.F., 14 x 20, \$7.25; do., M.F., 20 x 28, \$14.50; do., Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11; Alyn grade, 14 x 20, \$5.15; do., 20 x 28, \$10 @ \$10.25; D. R. D. grade, 14 x 20, \$4.90; do., 20 x 28, \$9.70. IC Coke: Penlan grade, \$5; do., J. B. grade, 14 x 20, full weight, \$5.15; do., 100 lb, \$4.75; do., 95 lb, \$4.62½; do., 90 lb, \$4.55. IC Bessemer Steel, Coke finish: 14 x 20, full weight, \$5.12½; do., 100 lb, \$4.70 @ \$4.75; do., 95 lb, \$4.60; do., 90 lb, \$4.50. IC Bessemer Steel, Coke finish, sq., \$5.30. IC Siemens Steel, Coke finish, sq., \$5.45. Wasters: S. T. P. grade, 14 x 20, \$4.60; do., S. T. P. grade, 20 x 28, \$9; do., Albearne grade, 14 x 20, \$4.90.

Henry B. Shields of Girard, Ohio, manager of the Biwabik Bessemer Company, has been in Duluth the past week making arrangements under the large contracts made by his company with Fitzgerald Bros. & Fisk for mining the Biwabik. Though the contract was signed only two weeks ago 275 men and three steam shovels are at work, and the property has been so far redeemed from its ruin of last year that mining begins next week. Nearly 100,000 tons monthly will be gotten out for the remainder of the season. During the coming winter 750 men will be worked and the original methods of operating the property will be radically changed. Through cuts will be made in the ore body so arranged that four steam shovels may work in the ore, this number being necessary to handle the output. The contractors are bound to be able to make in 1895, 1,000,000 tons. The Biwabik Bessemer Company pay the contractors a fixed sum for ore delivered on

railway cars in the mine, believed to be in the neighborhood of 22 cents, and advances on stripping removed 35 cents per yard.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, July 25, 1894.

Pig Tin has suffered a further decline in price, selling as low as £66. The depression was due to unfavourable American and Continental advices. New speculative buying was inadequate to uphold prices in view of light consumption and realizations by certain followers of the syndicate. The limited cash demand was readily met until Monday afternoon, when a more active demand came from operators for a rise. This buying caused about 15/ advance from the lowest point. The market to-day is weak, with £66. 5/ quoted for prompts and £66. 15/ for three months' futures.

Copper prices have fallen about 10/ and the market has been weak. Very little buying by speculators. Consumers reserved. This and reports of continued large output of American mines were the depressing influences. The low prices aroused buying interest the past few days and a good business was done. The market at the close was soft, with £38 @ £38. 2/6 quoted for spot and £38. 7/6 @ £38. 10/ for three months' futures.

The Tin Plate market has been weak. Inquiries are few and limits on bids are generally lowered, and this prevents business. Uncertain reports regarding American tariff legislation also have unfavorable influence. On open offering prices are about 3 pence lower than they were last week. Prices f.o.b. at Swansea are as follows:

Bessemer Cokes, 14 x 20.....	@ 10/
Siemens Cokes, 14 x 20.....	@ 10/3
Ternes, double box.....	@ 13/
Charcoals.....	11/ @ 13/

Black Plate has met with rather slow sale. Prices are easy at about £7. 17/6 for Bessemer and £8. 2/6 for Siemens.

Pig Lead has undergone hardly any change. Soft Spanish realizes £9. 7/6 @ £9. 10/ and sales are moderate.

Spelter remains quiet, but prices are steady at £15. 17/6 for ordinary Silesian.

Pig Iron warrants have firmed almost stationary in price and quiet. Late sales were at 41/10 @ 41/11 for Scotch, 35/4½ for Cleveland, and 44/ for Hematite.

A correspondent of the Boston *Transcript* draws a somber picture of the decadence of farming in the New Hampshire hill country. He says that land formerly well cultivated is becoming gradually encroached on by the forest, and no effort is made by the farmers to maintain their fields in cultivation.

Aluminum drums are reported to have proved most successful in the German army. Not only are they lighter than the ordinary kind, but they are said to give out a much fuller and richer sound.

New York.

Office of *The Iron Age*, 96-102 Reade street, }
New York, July 25, 1894.

Pig Iron.—The majority of sellers continue to complain of extreme dullness. One case, however, is cited in which a consumer placed an order for delivery during the balance of the year who has thus far persistently purchased in small lots for immediate delivery. Virginia Irons continue to crowd the market at low prices, relatively little being heard of Alabama brands in that way. We quote standard brands \$12.50 @ \$13 for No. 1; \$11 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25.

Cast Iron Pipe.—The only large order placed during the week was a lot of 1600 tons for Annapolis, taken by Henry M. Warren & Co., at \$18.70. The Anniston Foundry bid \$19, and R. D. Wood & Co. \$20.70.

Spiegeleisen and Ferromanganese.—No transactions of any consequence are reported in foreign. We quote foreign Ferromanganese nominally \$52 @ \$53 for 80 %, at tidewater.

Billets and Rods.—The market is dull at \$19.50 @ \$20, tidewater, for domestic Billets, and \$26.75 @ \$27 for Wire Rods.

Steel Rails.—The market is exceedingly dull. In Girder Rails the mills are busy filling old contracts on which delivery has been delayed by the fuel troubles. Standard sections continue \$24.80 at tidewater.

Track Material.—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—The market is lifeless. There is, however, some activity in Cotton Ties. We quote: Beams up to 15-inch, 1.40¢ @ 1.50¢ for round lots; Angles, 1.30¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.40¢ @ 1.50¢, on dock. Steel Plates are 1.35¢ @ 1.40¢ for Tank; 1.45¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.20¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 70¢ @ 75¢ @ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.75¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

All over Scotland, and especially on the Clyde, the greatest activity prevailed in the shipbuilding industry at the end of June. The only drawback has been the poor price at which work had to be taken. On the Clyde alone 39,690 tons of shipping, of which the larger proportion was iron steam vessels, were launched in the month of June, making a total of 165,283 tons from that district for the first half of this year, against 118,699 tons in the first half of 1893. There are at present building in various shipyards on the

Clyde 14 war vessels for the British navy, including a first-class battle ship, one first-class cruiser, four cruisers of the second class and eight torpedo boat destroyers. The aggregate tonnage of these vessels is about 33,340 tons.

Pittsburgh Engines for the U. S. Government.

The Westinghouse Machine Company of Pittsburgh have just completed and tested three of their high speed compound engines of 440 horse power each, which are intended for driving the Centrifugal Pumping Plant at Sault Ste. Marie, Mich. These pumps are to empty the 800-foot lock of the canal, and the plant was designed by Julian Kennedy, M. E., of Pittsburgh. The engines were tested at the works of the Westinghouse Machine Company, and the tests conducted by Julian Kennedy, acting for Col. O. M. Poe, Bt. Brig.-Gen., U. S. Army, who is in charge of the Government work at this point. The engines were driven at 250 revolutions per minute, under 150 pounds steam pressure, and the load applied by two water brakes and bands. The entire load of 440 indicated horse-power was maintained for 10 hours continuously in each case. The exhaust steam from the engine was conveyed into a surface condenser, and the resulting water carefully weighed and charged against the engine. The indicator was applied and diagrams taken during each test and from these the horse-power was computed. After the completion of each test the engine was dismantled for the careful scrutiny of each part. The following is an extract from the report made by Mr. Kennedy to Colonel Poe: "The steam consumption of these engines per indicated horse-power was 22.39, 21.66 and 21.84 pounds per hour respectively, the consumption per brake horse-power being about 10 per cent. greater. The performance of the engines in this respect was extremely gratifying. The engines were located 250 feet from the boiler, and the steam used includes all entrained moisture, no corrections or allowances of any kind having been made. All three of the engines ran with the utmost smoothness." As the engines were new, and running without vacuum, the above showing is very gratifying to the builders. In a letter accompanying copy of the formal report, Mr. Kennedy writes as follows: "Considering that the engines were, during the test, running under a load of from 10 to 15 per cent. above the proper load for maximum economy, and that the engines had hardly any preliminary work before the test, the results as to economy I consider very creditable indeed." Mr. Kennedy's report to Colonel Poe is pronounced by that very eminent authority as "entirely satisfactory." "The report is a model."

The Pittsburgh Tin Plate Works, New Kensington, Pa., manufacturers of American tin and terne plates, have been succeeded by the Pittsburgh Tin Plate Works, Incorporated, which concern were recently granted a charter of incorporation, with a capital of \$100,000. The officers are as follows: Chas. Parkin, president; C. W. Tindle, vice-president; W. P. Beaver, secretary; W. N. Voegtly, treasurer, and J. B. Strawbridge, general manager. As already noted in these columns, the new concern have let contracts for the erection of suitable buildings and machin-

ery, and when these are completed will manufacture their own sheets for tinning purposes, instead of buying them in the open market as heretofore. The main building is to be 140 x 100 feet, boiler house 45 x 35 feet, and pickling house 40 x 30 feet. The engine is a Hamilton-Corliss, with cylinder 36 x 72 inches and fly wheel weighing 60 tons. The plant now under construction is designed for three hot mills, with a view of enlarging to six when desired. It is stated that the plant will be of the most modern design, and the best in arrangement that can be secured. It is hoped to have the work now under way completed by October 1, and with that end in view a large force of workmen have been engaged and are pushing the construction as fast as possible.

New Publications.

THE IRON BEARING ROCKS OF THE MESABI RANGE. By J. Edward Spurr. Bulletin No. X Geological and Natural History Survey of Minnesota. N. H. Winchell, State Geologist, Minneapolis, 1894.

A handsomely equipped volume, so far as maps are concerned, has been issued by the Geological Survey of Minnesota, embodying the result of a special study of the iron bearing rocks of the Mesabi, made by J. Edward Spurr. It is strictly geological in its character and does not attempt to draw inferences which might guide the explorer or aid directly in the development of known deposits. Nor does it deal with the ores themselves, or with the commercial and technical aspect of their extraction. We emphasize this because many might be inclined to seek in the volume what it does not pretend to touch upon. As a geological monograph it is particularly interesting, since the famous young giant range presents many perplexing questions.

The New York *Herald* reports an interview with George Bruce, who has been attacking the National Lead Company, in which he gives the cost of manufacturing white lead. The figures are as follows, per ton:

Building and discharging:	
Melting labor.....	\$0.12
Building labor.....	1.43
Acetic acid.....	.44
Tan bark.....	1.63
Lumber.....	.10
Lumber.....	.01
Gunny bags.....	.10
Discharging labor.....	.96
Pots destroyed.....	.45
Loss on corrosion.....	3.23

Total, building and discharging, per ton.....\$8.47

Then for water grinding and drying we have these items of cost per ton:

Water mills and drying labor.....	\$0.52
Water.....	.06
Repairs.....	.58
Fuel.....	.59
Factory supplies.....	.16
Sundry factory expenses.....	1.12

Total.....\$3.03

Adding these totals we find that the whole cost of manufacturing white lead per ton is \$11.50. the cost of pig lead used per 100 pounds is \$3.50. The loss on dross per 100 pounds is 1 cent. The net gain in weight of lead is a fraction less than 25 per cent. This makes the cost per pound of white lead 3.341 cents. These are the figures from No. 8 district, including three factories in Brooklyn and one in Staten Island. The other districts have headquarters in Boston, Pittsburgh, Philadelphia, Cleveland, Buffalo, Chicago, St. Louis and Cincinnati.

HARDWARE.

Condition of Trade.

MANUFACTURERS and their representatives usually refer to business as very quiet, but further inquiry generally develops the fact that some trade is doing. A good many travelers are on the road, but they are not all out as yet, the condition of business making their work, so far as immediate returns are concerned, rather disappointing. The importance of keeping in touch with the trade and securing such business as is going makes some enterprising houses regard the present as a good time to cultivate their customers and form new connections, if possible, and thus lay the foundation for future business. The uncertainty in regard to the Tariff bill is still exerting its depressing influence, and the doubt as to what will be the final outcome is at the present time having an exceedingly unfavorable effect. In the matter of prices there is little to report. Comparatively few open changes have been made by manufacturers, but in a good many lines the gradual declines which have been taking place as small extra discounts have followed one another have lowered the price of a good many leading goods. Under these circumstances it is not surprising that there is something of a lack of uniformity in quotations as made by the different manufacturers and by the leading jobbing houses. The careful buyer, whether connected with the wholesale or the retail trade, is required to give much attention to prices that he may be enabled to place his orders judiciously and to the best advantage. There is a perceptible tendency on the part of leading jobbers to quote what would in ordinary circumstances be regarded as very close prices to their retail customers, and the market is feeling the effect of the "cut prices" thus made.

Chicago.

(By Telegraph.)

The demand for Shelf Hardware has steadily improved since the termination of the railroad strike, and business is now in very much better condition than it was two weeks since, but there is still room for considerable improvement. Orders are small but numerous,

and of such a character that unusually close attention must be paid to their trade by traveling salesmen. Merchants appear to order what they need every day and are seldom anticipating their requirements for even a week. The salesman on the spot gets the order. Here and there a new stock is being put in by some one who sees an opportunity for engaging in business, but new ventures are much less numerous than in previous years. Some little demand is reported for fall and winter goods, but as such orders are entered for future delivery, they are having no effect in the present movement of merchandise. A hopeful feeling prevails among the jobbers in this vicinity owing to the encouraging reports received from their representatives regarding the crops in the different sections tributary to this market. Overflowing granaries, they believe, mean a much better business among farmers, notwithstanding low prices for grain. The Heavy Hardware trade is in good condition, although the demand is almost entirely for small lots. These orders, however, are quite numerous, and every day piles up a good aggregate.

St. Louis.

(By Telegraph.)

Hardware jobbers are just now passing through the dullest period of the year and do not look for any large trade at this time. At the same time, however, there is a fair trade, which, while it runs largely to staple goods, is on the whole satisfactory. A great many mail orders are being received and their frequency is an indication that the retailer throughout the country is carrying in stock only what is absolutely necessary. Prices are beginning to show more firmness. The recent advance in Shovels and Spades is being adhered to. Wire Nails are firmer. Tin Plates, Stove Boards and some lines of Tinnerns' Supplies are also higher. Crop reports are all of an encouraging nature and the only impediment to a good fall trade is the mixed condition of affairs in Washington regarding the tariff. If Congress does anything at all it will have to be done at once or else the fall trade will be as unsatisfactory as was the spring trade. As a result of the recent railroad troubles, collections have suffered and can only be reported as being fair.

Notes on Prices.

Wire Nails.—The Wire Nail market continues without special feature, the mills being shut down and manufacturers are refraining from making special effort to secure orders. They appar-

ently regard the outlook as promising for the maintenance of present prices, and some of them refer to the fact that if the fall trade should set in with any degree of vigor there would probably be a stiffening in the market. In the mean time the volume of business is light, as merchants are indisposed to place orders in excess of their requirements, and in the present condition of business their immediate needs are not large. Quotations continue on the basis of \$1.15 for carload lots at mill, a figure which is, however, sometimes shaded, but none of the manufacturers are willing to quote lower than \$1.10. The New York price for small lots from store is \$1.30 to \$1.35.

Chicago, by Telegraph.—The fall trade seems to be starting up and some buying from manufacturers is going on even in Chicago, which has been thus far troubled with a surplus stock. Manufacturers are very confident that they will be able to maintain prices. They seem to have control of the situation and are not disposed to press sales and sacrifice what little advantage they may have at present. Factories will start up about August 1. Prices on factory lots range from \$1.18 to \$1.25, Chicago. Jobbers report that their customers are not disposed to buy heavily, but are acting very cautiously, as they do not wish to be caught in a decline. The movement of Nails, as well as other staple goods, is increasing to some extent, and better business is looked for from this time forward. Small lots from stock are quoted at \$1.25.

Cut Nails.—In the present state of trade the volume of business in Cut Nails is naturally light, but the manufacturers are adhering quite firmly to prices which have prevailed for the past few weeks. The Eastern market is represented by the quotation of 95 cents to \$1 for carload lots on dock. The store price for Cut Nails in New York is \$1.10 to \$1.15.

Chicago, by Telegraph.—Inquiries are improving, but the volume of business is still only moderate. Prices are a trifle firmer and mill shipments may now be quoted at 95 cents, Chicago, for 60-cent average. Small lots from jobbers' stocks are selling at \$1.15.

Barb Wire.—There is as yet exceedingly little movement in Barb Wire and prices are unchanged. Manufacturers are refraining from making important concessions in order to secure business, and some of them express hopeful views in regard to the fall trade. The market is represented as at our last report by

the following prices for Four-Point Galvanized delivered at the points named, but it is thought that concessions from these prices could be obtained on attractive orders: Pittsburgh, \$3.05 to \$2.10; Cleveland, \$2.10 to \$2.15; Cincinnati or Allentown, \$2.25 to \$2.30; Chicago or New York, \$2.25 to \$2.30.

Chicago, by Telegraph.—The movement is light but there is still no indication of uneasiness among manufacturers. They are probably in a better position to sustain prices than for many months. Their raw material is firm and besides a good understanding prevails among them now and any changes in price seem to be made in unison. Jobbers quote small lots of Galvanized Barb Wire from stock at \$2.35 to \$2.40, with 10 cents off for carload lots. Quite a brisk trade has been done in some quarters in Plain Wire, on which recent advances are well sustained.

Sargent & Co.—In connection with their new catalogue, reference to which is made in another column, Sargent & Co., New York, and New Haven, Conn., issue a discount sheet of special interest to the trade. It gives not only the discounts on the very large and important line of goods of their own manufacture, but also on an extensive assortment of general Hardware, which includes many leading goods. These prices are carefully revised up to date.

Cabinet Locks.—The prices on Cabinet Locks are unsettled and the market is in an unsatisfactory condition. This is largely the result of the new competition which recently entered the field, earnest efforts being made by them to obtain business, while the old manufacturers are apparently determined to hold their trade.

Padlocks.—While there has been no open change in the price of Padlocks, there has been for some time a weakness which results in somewhat lower quotations than prevailed a few months ago. There is some unevenness in the quotations of the different manufacturers, who are evidently desirous of securing such orders as may be within their reach.

Wrought Goods.—The market for Wrought Iron Goods is in an unsatisfactory condition, prices being low and irregular, low quotations being more readily obtainable by the smaller trade than is usually the case.

Bright Wire Goods.—The demoralization in the price of Bright Wire Goods, to which we referred some time ago, still continues and the market is lower and somewhat irregular. Manufacturers appear to be giving discounts which approximate their extreme prices somewhat more freely than a short time ago, and many of the leading jobbing houses are quoting this line of goods at low prices.

Screws.—The Screw market is at present an open one, the agreement

which has existed among the principal manufacturers having terminated June 30. Whether or not there will be a renewal of it is a question, but it is understood that some conferences have been had with this end in view.

The Lebanon Broiler.—This article, of which a description is given in another column, is put on the market by the Seltzer Specialty Company, Lebanon, Pa. The Broiler is sold at \$9 per dozen list, subject to a discount of 33½ per cent. to the trade.

Change Deliverer.—The Coin or Change Deliverer illustrated in our last issue, and marketed by the Francis T. Witte Hardware Company, 106 Chambers street, New York, is sold at \$7.50 each, subject to a discount of 25 per cent.; or in lots of six or more, to a discount of 33½ per cent.

Double Pointed Tacks.—An advance has been made by the manufacturers of Double Pointed Tacks, and as a result the market is in a better condition than for some time.

Glass.—The demand for American Window Glass shows no improvement since our last review, although the volume of business is, of course, greater than a few weeks since. The bulk of the business done is in small lots to meet immediate needs. Manufacturers and jobbers are watching the tariff question closely, and conducting their business in such a way that, in the event of the passage of any low tariff measure, they will have little or no stock on hand. The Pittsburgh quotation on Window Glass continues at 80 and 20 per cent. discount, a price which is reported to be firmly maintained. Plate Glass is in fair demand. Quotations for New York and New England,

on the Eastern list, are 70 per cent. discount for sizes 5 feet and over, and 70 and 10 per cent. discount for sizes 5 feet and under. For the West quotations are reported as 70 and 5 per cent. discount for sizes over 10 feet, and 60 and 20 per cent. discount on sizes 10 feet and less, Western manufacturers' list.

Hardware Club of New York.

THE FOLLOWING GENTLEMEN have recently joined the Hardware Club, having been elected at a meeting of the Board, July 24:

ROBERT N. BOLTON,
45 Barclay street, New York.
H. DURANT CHEEVER,
13 Park Row, New York.
CHARLES A. DU VIVIER,
22 Warren street, New York.
HON. SIMON M. EHRLICH,
Chief Judge City Court.
R. C. FIELD,
Smith, Lyon & Field, New York.
EDWARD H. GOODMAN,
Union Switch & Signal Company,
Swissvale, Pa.
ROBERT E. JENNINGS,
West Bergen, Jersey City, N. J.
HUBERT L. JUDD,
H. L. Judd & Company, New York.
FERDINAND W. KELLER,
243 Broadway, New York.
H. S. LEONARD,
New Haven Wire Mfg. Company, New Haven, Conn.
CHARLES L. MEAD,
Stanley Rule & Level Co., New York.
CHARLES C. RUTHRAUFF,
Vanderbilt Building, New York.
CHARLES A. SMITH,
44 West Broadway, New York.
JEFFERSON D. THOMPSON,
271 Broadway, New York.
FRANK N. WHITE,
23 Warren street, New York.
HON. ROBERT A. VAN WYCK,
Judge City Court.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Is the Jobber Necessary?

In the following communication a gentleman long and prominently connected with the Hardware trade thus discusses the question, which has been touched upon in some of its different aspects in recent issues of this journal:

Why not "tell the truth" concerning the relations of the jobber to the manufacturer; "the whole truth?" The future is entirely clear.

1. There must be "distributors," as W. G. Smythe of Russell & Erwin Mfg. Company called them in his speech at the Richmond convention.

2. There are very few *strictly* jobbers any more. Look at Simmons, Birmingham, Weed and others, as well as all the jobbers outside of the very large cities; nearly all of them are retailers also, and I venture to say there is not a jobber to-day in the West or South who is not either retailing or consider-

ing the question of retailing under the same or another roof.

3. The tendency of the manufacturer to solicit retail trade has been checked by the knowledge, acquired at very large expense, that there is a big block of trade that must be "distributed" to.

4. Vast injury to both classes has inured from the "kicking" of the jobbers against the selling by the manufacturer of a class of retail trade that buys and will buy direct, and by the antagonism thus developed the manufacturer has angrily rushed off after trade that can only be profitably reached through distributors.

5. The matter will never be settled on the same basis for the entire country. The same conditions do not prevail in Ohio as in Texas, but it can and must be settled by a mutual recognition of the facts in each case. C. S. Landers, who heretofore had been regarded as somewhat ultra in his idea of selling retail trade, stated it very plainly in

his speech at Richmond: "I have thoroughly tried it" said he, "and I state from experience that the manufacturers and the distributors must co-operate in the interests of both. There is a very large class of trade that must go to the distributors, and there is another class of trade that will buy from some manufacturer." The individual localities should be the subject of a fair conference, and the money spent in fruitless competition for the same trade saved. There will then be a profit, even if a small one, fairly divided. The only salvation to both manufacturer and jobber is a sensible co-operation.

The same question is thus discussed by a New York manufacturer, whose conclusion appears to be substantially the same as that reached in the letter printed above:

The letter of a Westerner in your issue of July 19 in reference to the question, "Is the Jobber Necessary?" is read with much interest, and while looking at this subject from an entirely different standpoint (that of a manufacturer), we desire to indorse his position as not only reasonable and logical but correct.

The business of the manufacturer is to produce the particular line of goods in which he is interested and to place them upon the market to the best advantage; and as a result of many years' experience we are firmly convinced that this can be done most advantageously by making use of the "middleman," who by reason of his position and special equipment is best fitted for making and serving the masses of retailers of his particular locality.

And not only is this a convenience to the manufacturer, but is equally desirable to the smaller buyer, who is enabled to procure his supplies more promptly and advantageously from the storehouse of the jobber by reason of the closer proximity, but in many cases the saving in freight on the larger shipment is in itself a sufficient reason for allowing the jobber to act as the third party, who shall order in one shipment many times more goods than the retailer would feel justified in buying at one time.

We do not believe either the manufacturer or the retailer could afford to let their mutual friend, the jobber, go.

Publication of Prices.

A Pennsylvania manufacturer and merchant remarks in a communication that wholesale merchants are occasioned much trouble by the circulation of prices among retailers and consumers, and refers to the annoyance he has experienced as follows:

Scarcely a day passes with me that I am not compelled to get around some trade journal quotation as against some quotation that I have given a customer. Where one is connected with a retail store they do not notice this so much; but those who do a wholesale business large or small, and especially where they have a mill supply trade, will readily notice that it is a decided injury to have prices used as freely and openly as they are in the trade journal of the present time. The benefit it does small dealers, in my estimation, is decidedly overbalanced by the harm it does the jobber in connection with his smaller trade.

The writer gives instances to illustrate this point, one of which is as follows:

A customer who was a small dealer and extremely slow pay sent in an order for 200 pounds of Barb Wire.

At that time we were paying \$2.60 for it at the mill, with a 5-cent freight rate. We charged him \$2.90 per hundred for it and did not think the price excessive. He immediately wrote us objecting to what he called an excessive charge, and gave a certain trade journal quotation of \$2.60 to substantiate his claim. We explained to him that we paid freight and cartage in addition to this price and could not sell for less money, but to no purpose.

In regard to farmers and other small trade, who frequently find quotations on staple goods in the daily papers, our correspondent remarks that such persons do not understand that when Nails are quoted at 90 cents to \$1 a keg, 8d Nails cost 60 cents more.

The writer apparently regards the demoralization of prices as coming in good part from quotations published in trade journals, an opinion, however, which is not sustained by the facts, inasmuch as many lines have developed extremely low and unsatisfactory prices which are not quoted in the market reports of the papers.

Repair Shops in Connection with Hardware Stores.

The following letter, which explains itself, we take pleasure in submitting to the attention of Hardwaremen. Our correspondent inquires with reference to the feasibility of having in connection with the Hardware store a shop for miscellaneous repairing. Some of our readers may be able to help him with practical suggestions in regard to this matter. We shall be glad to hear from them in regard to it.

As in most country Hardware stores, I have a vise on a counter and a drawer near by with a miscellaneous lot of broken and damaged tools, among which are some files, a hammer, firmer chisel, cold chisel, nail puller, screw driver, wrench, plier, some nails, a few screws, odd nuts and bolts, pieces of sand paper, &c. Some of the tools we have taken from stock as required for repairing or making things about the store and others are defective ones returned by customers, but they are a sorry looking lot.

We occasionally use the vise and tools ourselves—in fact, could not get along without them; but they are in larger demand by our neighbors, whose first impulse is to run to the Hardware store when anything needs fixing, and as neighbors I cannot very well refuse them the use of the tools. They usually get stuck and call on one of the clerks to help them out; or they need a screw or some nails, a bolt or nut, which on account of friendship they are not charged for. The neighbors often leave the tools in a worse condition than they find them, if that is possible, take the time of the clerks and have donations of stock made them.

I have some key fitting to do, and occasionally some one brings in a lawn mower or some larger thing to be repaired. I have not solicited these jobs and usually refuse to tackle the larger ones, as I have not the tools or room to undertake such work.

I read the article on "Bicycle and General Repair Shops" in *The Iron Age* of May 17 with much interest, and have wondered if I could not make something of that kind pay. By making a business of doing jobs I could charge my neighbors for doing their work instead of letting them do it themselves, and by advertising that I am running

a general repair shop for doing odd jobs, and am prepared to fit keys, repair locks, lawn mowers, trunks, sharpen knives, &c., I think I could make it pay, and perhaps inside of a year would have enough work to keep one man busy most of the time.

Then I have begun handling Bicycles this season, and I could doubtless have some Bicycle repairing to do if I were fixed for it. I could take that and other kinds of repairing, and if I was not fixed for doing it myself I could send it away to be done.

Now I will come to the point: I would like some advice from those of your readers who have shops for doing general repairing, how to arrange my shop, and if I would require a lathe, forge and anvil to supplement what small tools I could take from stock.

Another thing, I have not room for as large a shop as Mr. Janssen described; in fact, there is only an available space of about 5 x 10 feet which I could take for this purpose. This is at the rear of the store, but is lighted by a window. I suppose I would require it partitioned off in some way to keep out intruders, and wonder if poultry netting put on a light frame work, with a door and lock, would not answer, as I do not want to go to the expense of sash, and I also need the air.

I think I have given you a fair idea of my requirements, and if any of your readers can help me by suggestions I shall be very much obliged.

The subject which our correspondent thus opens up is one of a good deal of general interest, and we presume that not a few of the Hardware merchants throughout the country have had an experience similar to our correspondent's. Any who have a shop for general repairing in connection with their Hardware business will doubtless be able to give suggestions and information which will be of service, not only to the merchant whose letter is given above, but to multitudes of other Hardwaremen in all parts of the land.

Sargent & Co.'s New Catalogue

WE HAVE RECEIVED an advance copy of Sargent & Co.'s new catalogue. The trade publications of this house for many years have taken a prominent position in Hardware literature, and the volume before us sustains the reputation of the firm in the catalogue line, surpassing, as it does, former books which they have issued. The book is clearly the outcome of careful study for the best effect, long experience as to the requirements of the trade and a practical knowledge of how to obtain desired results. Attention is first attracted by the binding, which is somewhat of a novelty. By a combination of printed book binding and blank book binding, together with some new and original devices, an effect is produced which is decidedly attractive and which differs from anything we have seen. The back is made in three panels. The center panel is equal in size to both top and bottom panels combined, and is deeply recessed and covered with a highly polished black leather. This is prominently stamped in gold with the firm name and cur-

rent year. The top and bottom panels are of dark green morocco and project beyond the center panel so as to receive the wear and effectually protect the finish. The sides of the book are covered with a dark green cloth, matching the leather and stamped in blank with a design resembling a Hinge Plate; upon which "Sargent & Co." is lettered in gold. The edges are colored in a new shade to harmonize with the color of the binding. The binding is not only rich, but strong and durable as well. The book has a spring back, permitting it to lie flat wherever opened.

An engraving of the extensive works at New Haven, Conn., is shown on the first page of the book and this is followed by the title page and indexes. The alphabetical index is as usual very complete, each item being indexed and cross indexed in every practicable way. A new feature is the numerical index, in which the numbers of all goods made by Sargent & Co. are printed in numerical order immediately followed by the names of the items and the pages on which they may be found. For instance, it is desired to find No. 108 Coat and Hat Hooks. At a glance it is seen that they are on page 570, thus saving the time which would be consumed in looking through 20 pages of Coat and Hat Hooks. This numerical index is an excellent feature and will be found exceedingly useful to all who consult the book.

About 200 pages are used to show the line of Locks and Trimmings made by the company. The pages are very compact and well arranged, so that questions which may be asked in regard to a Lock or Escutcheon can be answered instantly. In connection with each style of Lock there is a uniform panel in the upper right hand corner of the page in which are given the size of the Lock, distance from face to center of keyhole, size and kind of hub, information in regard to the hand and other points needed by those who handle Locks. This panel is in the same place on every page, is always in the same type and the mode of expression never differs, so that when one panel is understood all are.

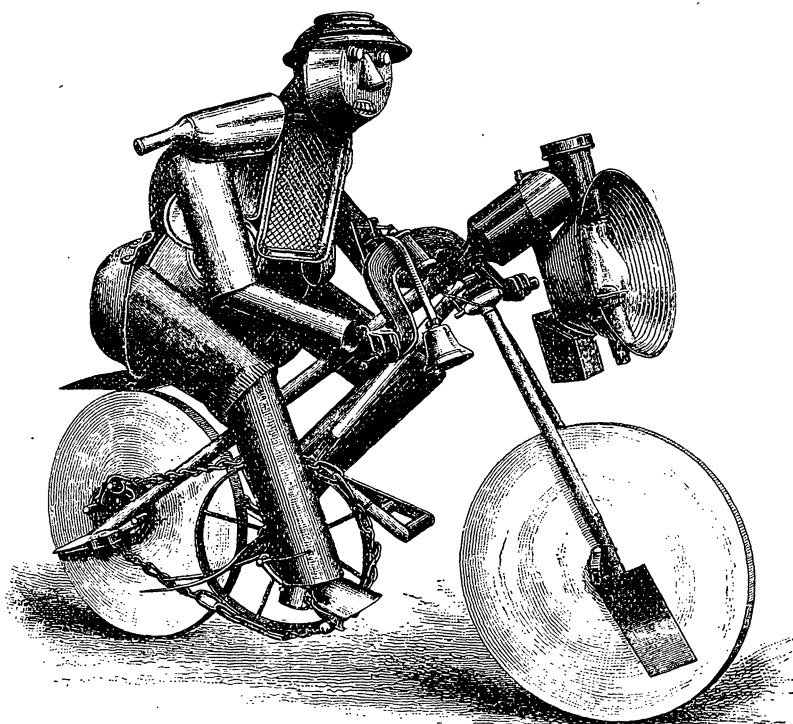
There are several pages of sets of Locks with trimmings, those for inside doors being shown on pages 56 to 61 and for front doors on pages 94 to 105. The sets are illustrated complete, half-size cuts being used, and in addition the matter is arranged in tables which make clear how the sets are made up.

A note on page 195 directs attention to the fact that on the pages following to 215, inclusive, are "illustrated and described the Lock Trimmings and other Hardware, in which one design is carried out in all the necessary trimmings for a house." Here, it is noticed, small cuts have been used, but the measurements of each article are given in connection with the number. This feature is likely to be much appreciated, especially by architects and any who are charged with selecting a suitable trimming for buildings.

The pages of general Hardware follow and the regular Sargent style is used in their make up, compactness and clearness being the points sought. The goods manufactured at the works at New Haven are shown on pages 1

to 857 inclusive. Among so many well arranged and effective pages it is difficult to particularize, but those relating to Store Door Handles, while very solid pages, are perfectly plain. Coat and Hat Hooks are represented in an attractive manner. Transom Lifters, Axle Pulleys, Screw Drivers and Iron Planes are all well arranged. The page of Steel Squares is probably one of the best in the book; on it may be found all the markings on the Squares, something which we believe has not heretofore been attempted. The pages of Tacks show great care in their composition; also those on which Maydole's and other Steel Hammers are shown. U. S. Saws, pages 948, &c., make a fine appearance. Very complete pages are those devoted to Augers and Bits, while the pages of Gimlets and Corkscrews show much ingenuity in their make up. The Oil-stone pages and the page of Shovels and Spades contain considerable matter, but a judicious use of selected

an attraction that it was allowed to remain on exhibition much longer. The cycle was labeled "Household Wants, '95 Model," and at times drew such crowds that they filled the pavement and a portion of the street. The wheels of the machine were grindstones, the front sprocket a wheel barrow wheel, and the rear sprocket a lard press screw head. The chain on the sprocket wheel was formed of stay chains, and for the step a No. 4 broad axe was used. The upper frame bar was a post hole digger, the lower frame bar a four tine D-handle manure fork and the seat was a molder's shovel. For the front fork two boys' spades were used, with a screw wrench for the front axle. The handle bars were a No. 4 bell yoke, with an engine bell attached, and a side lamp for a lan-



Household Wants, '95 Model.

type avoids the appearance of crowding.

The catalogue is a superb volume, finely printed, well bound, complete in arrangement, and one which will be found valuable for daily use on the desk or counter of the Hardware dealer.

The compiler of the book, W. J. Ladd, and his principal assistant, J. Fred. Wright, are to be congratulated on the success of their efforts to produce a reliable and well matured catalogue of general Hardware.

"Household Wants, '95 Model"

THE ACCOMPANYING CUT represents a bicycle and rider, arranged by George B. Hart of the firm of George O. Hart & Son, Paducah, Ky., as a window display. The firm intended leaving it in the show window for a week, but it proved such

tern. The crank arms were sausage meat cutter cranks, and the pedals were rat traps. The rider had a pudding pan face. can screw eyes, a coffee spout for a nose and a patty pan for lips and teeth. Four dish pans were used for the rider's body, grocer scoops for shoulders, conductor pipe for arms, stove pipe for legs, pint cups for heels, small grocer scoops for feet, garden weeder for hands, a nicked tray for shirt front and a japanned wash pan for a hat. The selection and arrangement of the articles in making up the exhibit is unique to a marked degree, and probably attracted more attention than an elaborately and handsomely dressed window. The design appeals to all beholders, as the goods used are familiar and in everyday use. This window display will doubtless suggest many ideas to Hardware merchants which can be worked out and result in much benefit to them.

Metal and Hardware Association of Montreal.

THIS ASSOCIATION has been formed as a branch of the Montreal Board of Trade, the full title being the Metal and Hardware Association of the Montreal Board of Trade. The membership comprises firms who are represented by one or more partners in the Board of Trade itself. It is provided, however, that all firms in Canada doing business as wholesale Shelf and Heavy Hardware merchants, or as agents for Canadian or foreign manufacturers of those goods, and manufacturers of pig iron and rolled iron and steel, iron founders and iron workers generally, are eligible to membership. The object of the association is to promote the advancement of trade, and to watch over such matters as may from time to time arise affecting the trade interests of its members.

The officers consist of a president, treasurer and four directors, the Board of Trade's secretary acting in the same capacity for all branch organizations. The members of the association meet informally every Wednesday at noon in the Board of Trade Building, while regular meetings are held on the first Wednesday of each month. The annual meeting for the election of officers, &c., takes place on the first Wednesday in December.

Several years ago a Hardware association was formed in Montreal, which during its existence was successful in bringing about uniformity of practice in several trade matters which had previously been the source of much annoyance and vexation. The present association will deal with commercial matters of mutual concern, and will also seek to harmonize opinion on existing or proposed legislation affecting the metal and Hardware interests. Its first work of the latter character was the appointment of a committee to go to Ottawa during the recent budget debate and point out to the Government certain anomalies in the metal schedule of the new tariff.

About 50 firms are at present represented in the association, as follows :

Abbott & Co.
Bacon Bros.
Blackwell, K. W.
Brush, Geo. S.
Canada Iron Furnace Company.
Cooper, Jas.
Chisholm, Chas. J.
Copland & Co.
Clendinneng, Wm. & Son Company.
Coghlin, B. J.

Crathern & Caverhill.
Caverhill, Learmont & Co.
Dominion Wire Mfg. Company.
Drummond, McCall & Co.
Davidson, Thos. & Co.
Drummond, McCall Pipe Foundry Company.
Fyfe, Jas.
Gurney, Massey Company.
Gardner, Robert & Son.
Garth & Co.
Hanson, J. H.
Heney, E. N. & Co.
Holden, A. & Co.
Ives, H. R. & Co.
Knowles, W. M. & Co.
King, Warden & Son.
Lomer, Gerald.
Londonderry Iron Company.
Lewis Bros. & Co.
Leslie, A. C. & Co.
Letang, Letang & Co.
Machinery Supply Company.



JAMES CRATHERN.

President Metal and Hardware Association of Montreal.

McClary Mfg. Company.
McDougall, John.
Macpherson, A. & Son.
Middleton & Meredith.
Montreal Rolling Mills Company.
Paton, Thos. L.
Pyke, Jas. W. & Co.
Prowse, Geo. R.
Parker, Moses.
Pillow & Hersey Mfg. Company.
Rose, John B. & Co.
Rodden, Wm. & Co.
Robertson, Thos. & Co.
Thompson, B. & S. H. & Co.

James Crathern of Crathern & Caverhill is the president of the association. Mr. Crathern is a gentleman of exceptional business sagacity and deserved popularity. He was recently the recipient of a graceful compliment at the hands of the employees of his firm. The compliment took the form of a life-size oil portrait of Mr. Crathern and marked the fortieth year of the firm's existence. The portrait was painted by Robert Harris, R. C. A., a prominent portrait painter of Canada. We take pleasure herewith in giving a

reproduction of the portrait, reduced, of course, in size. It is scarcely necessary to say that a presentation of this character from his subordinates is a strong attestation of the sterling qualities possessed by the recipient.

Mr. Crathern began his business career in Montreal as an apprentice to the Hardware trade in 1844, and ten years later in company with John and Thomas Caverhill formed the firm of Crathern & Caverhill, of which he is now the only surviving member. The firm are well known throughout the Dominion as one of the leading wholesale Hardware and Metal houses.

Sending Out Statements.

THE FOLLOWING ARTICLE by W. S. Park, assistant treasurer of W. B. Belknap & Co., Louisville, Ky., discusses the position of statements in connection with the collection of accounts, and gives suggestions which deserve careful attention :

Some business men can tell why they succeed; others wonder why they fail. The successful man runs his business. A business can run itself; so can a wagon, but only down grade.

Every day we see business men riding down grade. They know they are moving, but do not bother themselves about the direction they are going, and never realize their true condition until they strike an obstruction. This obstruction they call experience. The business methods of such men should be avoided. The methods of a successful man or firm are worthy of close study.

A remarkable thing in connection with almost every assignment is the large showing of alleged assets called "accounts due the firm." Inability to collect outstanding accounts is the cause of almost all failures. The reason for this can be safely attributed to an underestimation of the value of regularly rendering properly prepared statements of accounts. It is

not surprising that a country merchant knows which firms he can "stand off;" he gains this knowledge by the statements sent him. The prompt or lax business methods of a firm are plainly shown on the faces of their monthly statements. Our country friends are not expected to watch our interests, but our statements should convince them that they do not therefore go unwatched. "Business is the salt of life."

There are statements of account and statements of no account. Observation of some 30 before us shows that only five of the number convey any intelligent idea of the expected result. If you send it "only for comparison," say so plainly; but do not waste too much time sending statements for this purpose alone. If it is sent as a reminder that the account is due, say so, politely, yet forcibly. About one-half of those before us are mere apologies—weak kneed affairs which disclose weak business methods.

The manner in which the statement is inclosed has its effect also. A man who receives a statement seldom at-

taches to it the importance you do, therefore you should not depreciate its value by making it apologetic or weak in any particular. This can be done in the typographical arrangement, in the wording, and by inclosing it with other printed matter. Advertising circulars destroy effectually the object of a statement. If mailing advertising matter pays, mail it by itself, but if you are expecting favorable results from the statement by combining the two, the chances are surely against you. One might argue that it costs 2 cents anyhow and why not put in circulars to make up the ounce? They might do some good, but are sure death to the effectiveness of your statement. The policy of getting something for nothing, or trying to, has ruined many fair prospects in business. Sooner or later we find out that it takes a cause to get an effect. Diamonds are not as easily obtained as gravel, or they could be bought for \$1 a load.

Contributory negligence is often spoken of, and the law justly holds that a man guilty of it has only himself to blame for losses sustained thereby. Are you getting satisfactory results from the statements you send out? If not, why not?

Lay aside your prejudices and consider this question, then mend your ways or suffer the consequences.

Export Notes.

Flint & Co., 64-68 Broad street, New York, exporters of American manufactured products, are doing considerable trade in iron and manufactures of iron and other metals with the Spanish West Indies, largely through their Havana representative Louis de Olazarra. This traffic has attained large proportions since the provisions of the reciprocity treaty became operative. Shipments were especially large in June, because it was feared Spain might reimpose duties on July 1, owing to changes in our own tariff laws regarding raw sugar. We are told there is a general expectation and good reasons for believing this arrangement in some form will be continued in any event, by which the United States will be favored above other countries. The order for 60 Brooks locomotives, to which allusion was made in a former issue, was placed with Flint & Co., by the Central Railroad of Brazil, and aggregated \$750,000 in our money.

R. H. Dana, as manager of the export department of the Biddle Purchasing Company, 168 Church street, New York, sailed for London on the steamer Columbia July 19. He will go to Cape Town, South Africa, and after several months' stay in the various commercial centers of the Cape colonies expects to continue on to Australia. His mission is to sell goods of American manufacture.

The Walter A. Wood Mowing & Reaping Machine Company, we are advised, shipped a total of 690 carloads of Harvesting Machinery abroad during the year 1893.

Orders are now being placed for a full electric light plant on a large scale, which is to be installed in Puerto

d'Espana, on the Island of, Trinidad, in the West Indies. Most of the articles purchased are supplied by the General Electric Company. They are also purchasing an equipment for a trolley electrical railroad, which is expected to be in operation within a year.

Other buyers are in the market for an outfit for a large coopering establishment abroad, in which American staves and headings will be turned into barrels by American machinery.

The gold fields of British, Dutch and French Guiana are the old Eldorado sought by Sir Walter Raleigh. He penetrated far into the interior, following the rivers, but failed to find the rich deposits. A large shipment of machinery, consisting of American Hydraulic plants and pumping outfits for working the rich gravel so abundant there has recently been made. The country is covered by a dense growth of tropical forest, but the Hydraulic Monitors, we are told, pay no attention to this. They wash the gold bearing gravel away from the roots, allowing the trees to fall in any direction. This machinery was invented in California.

Trade Items.

STANLEY WORKS, 79 Chambers street, New York, have brought the show-cases and goods displayed at the Columbian Exposition, Chicago, to this city and placed them on exhibition in their New York store. They have also hung the large framed India ink sketch, 5 x 3 feet, of their works at New Britain, Conn., which was a part of the Chicago exhibit, in their office here.

G. A. JOHNSTON AND T. P. CONANT, officials of the Sligo Iron Store Company, St. Louis, Mo., were recently in the city on a pleasure trip to the East. Having read much about the Hardware Club of New York, they were shown through the apartments and expressed themselves as finding it fully up to their expectations.

THE ROGERS & HAMILTON COMPANY, Waterbury, Conn., manufacturers of Silver Plated Ware, have placed James K. Caldwell in charge of their Chicago store as manager, at 110-112 Wabash avenue. Mr. Caldwell heretofore has served the company as Eastern salesman and is referred to by them as familiar with all the details of manufacturing Flat Ware, thoroughly competent and worthy of full confidence.

AMONG the special notices is one entitled "For Sale Low for Cash," in which an established Hardware store in Florida, with a stock estimated in value at \$15,000, is offered for sale. We are advised that the business is a prosperous one in a growing town, and that the opportunity thus presented is a favorable one deserving the attention of parties who are in position to avail themselves of it.

OVER THE STORE at 20 Dock Square, Boston, is the sign "A Hardware Store for a Hundred Years." This sign was placed there a few years ago by Burditt & Williams, who have occupied the premises since April 1, 1860, and who are naturally proud of the fact that the store is one of the very oldest in the country.

IN THEIR ADVERTISEMENT in this issue the Tie Company, Unadilla, N. Y., illustrate their Holdfast Corn Binder and enumerate ten reasons why it

should be used. This Corn Binder, has we are advised, had a most gratifying sale during the past two years, and the company have received many testimonials from parties who have used it. It is stated that the prices to the trade are one-third less than in 1893.

THE HARRIS TOY COMPANY, Toledo, Ohio, manufacturers of malleable iron and steel Toys, owing, we are told, to the increase in their Toy trade, have decided to discontinue the manufacture of Steel Body Express Wagons, as shown on pages 88 and 39 of their catalogue. The stock on hand will be closed out to dealers at special prices to make room for their large line of Metal Toys. The sizes to be disposed of range from 7½ x 15 inches size of body to 14 x 30 inches, including numbers 0, 1, 2 and 3. Their New York branch is at 107 Chambers street, in charge of Robert McLaren, Eastern representative.

THE ISSUE of the *Gazette* of Pontiac, Mich., for July 20, 1894, contains a page article concerning H. B. Seagrave, Hardware merchant, of that place. Mr. Seagrave engaged in business in Pontiac in 1888 and has, it is stated, met with gratifying success. Mr. Seagrave recently purchased the stock of R. B. Owen & Son, Detroit, at a cost of nearly \$10,000 and has removed it to Pontiac. Illustrations are given of the interior of R. B. Owen & Son's store, showing its admirable arrangement. Mr. Seagrave has lately added largely to his facilities and now occupies three floors, each 20 x 140 feet.

A RECENT ISSUE of the *Reformer* of Brattleboro, Vt., presents an illustration of the establishment of True & Blanchard, Hardware merchants, of that city. The business was established by W. W. True in 1884, and two years after E. C. Blanchard was admitted to the firm, the style becoming True & Blanchard. Their present quarters were built in 1888 and contain a floor space of over 12,000 square feet. The firm are carrying a stock, it is stated, valued at about \$20,000. True & Blanchard are also manufacturers of a number of specialties, including the Eureka Strainer Pail and Moore's Patent Storm Window Fastener. They also make Steel Boiling Arches, Sugar and Syrup Cans, &c.

EDWARD SCOTT, United States Commissioner, has notified the Putnam Horse Nail Company, Boston, Mass., that their exhibit of Putnam hot forged and hammer pointed Horse Nails at the California Midwinter International Exposition, San Francisco, has received the first award.

O. B. BARKER of Bell, Barker & Jennings, Lynchburg, Va., is spending a few days in New York, having arrived late last week.

THEILE & QUACK, Solingen, Germany, and 7 Bridge street, New York, are now in charge of the business of Koeller & Schmitz, 92 Reade street, dealers in imported Pocket Cutlery, Razors and Scissors.

E. LOTHAR SCHMITZ, formerly managing partner of Koeller & Schmitz, 92 Reade street, New York, owing to the demands on his time in connection with his Fox Safety Razor and Stropping Machines, has sold out his interest in the above concern, and hereafter will confine himself solely to the production and marketing of his Safety Razor. He expects shortly to bring out a new Stropping Machine for regular Razors. He has secured accommodations on the same floor heretofore occupied by him at 92 Reade street.

THE ILLINOIS PURE ALUMINUM COMPANY, Lemont, Ill., have recently constructed a novelty in the way of a Pure Aluminum Boat in three portable sec-

tions. While a few other Aluminum Boats have been constructed experimentally, it is stated that this is the first of its particular kind.

New Line of Horse Shoes.

JOHN LEONARD, 446-452 West street, New York, proprietor of the Manhattan Rolling Mill, has begun the manufacture of machine made Horseshoes by means of improved machinery invented by his superintendent. The Shoes are said to be made of the same quality of material as always put in the original Leonard Iron, rolled by him since about 1870. Since that date he has been rolling horseshoe iron favorably known in the trade for the forging of hand made Shoes. The large production of machine made Shoes having restricted his market for the bar iron has induced him to work up a portion of his own product. His mill rolls merchant bar iron, rounds, squares and flats, in addition to horseshoe iron and beveled horseshoe iron.

Price-Lists, Circulars, &c.

BUHL STAMPING COMPANY, Detroit, Mich.: Tubular Lanterns and Lamp Goods. Their fall catalogue has just been issued, in which they illustrate their Phoenix Lantern, new Buhl Side Lift Lanterns, Buhl Square Top Lift Lanterns, Buhl Dash Reflector Lamps with non-detachable basket guard, Buhl Tubular Headlight, Globes, Burners, &c. Their Lanterns, Nos. 15, 159 and 200, are recent additions to their line, and the company direct special attention to them. The catalogue also contains an index and telegraph code, which gives at a glance the number, catalogue page, cipher word and size, weight and bulk of case, for every lantern represented in it. This feature, the company mention, will be found especially convenient for export business.

N. N. HILL BRASS COMPANY, East Hampton, Conn.: Bells and Toys. Their illustrated catalogue and price-list for the season of 1894-1895 shows the line of these goods which they are putting on the market, including Chime Bell, Double Chime, Dumb Bell, Sleigh Bell and Teething Ring Rattles, Rolling, Horse and Buzz Chimes, Fire Gong, Alligator Bell Toy, Turtle and Frog Bell Toy, Chime Bell Toy, Boys' Driving Reins, Tea Bells, pure cast bell metal Hand Bells, cast brass Hand Bells, Double Chime Hand Bell, Call, Bicycle and Sleigh Bells, Gong Shaft Chimes, Band Shaft Chimes, Tuned Shaft Chimes, Saddle Chimes, &c.

GEO. L. THOMPSON MFG. COMPANY, 6126-6130 La Salle street, Chicago: Curling Irons and Hardware Specialties. The company have issued a catalogue, dated July 1, 1894, in which illustrations are given of their exceptionally large and complete line of Curling Irons. The catalogue also illustrates their Peerless Lamp Chimney Stove, Tip Top Lamp Chimney Stove, Rambler Alcohol Stove, Acorn Towel Rack, Blue Point Tracing Wheel, &c. Their Skip Skip, a substitute for the skipping rope, is also represented.

SHELDON AXLE COMPANY, Wilkes-barre, Pa.: Axles. The company have issued a standard price-list, July 1, 1894, of their Anchor Brand, Dragon Brand and Richard's Long Distance Axles, in which the different goods comprising their line are illustrated. A number of blank pages in the list are ruled appropriately for memoranda.

THE ETTÉ & HENGER MFG. COMPANY, St. Louis: A pamphlet of eight pages to be inserted in their catalogue

No. 5, which was recently issued. The pamphlet contains illustrations of a new iron and a new brass Bracket, which are made in several sizes, and as the manufacturers inform us, are finely finished. Illustrations are also given of the National and Globe Traps, the National Basin Waste and National Bath Waste. A line of brass Towel Racks, Sponge and Glass Holders and brass, nickel plated Soap Cups are also shown.

ILLINOIS PURE ALUMINUM COMPANY, Lemont, Ill.: Pure aluminum Cooking Utensils. The company have issued a four-page circular in which illustrations of their utensils are given, together with a number of testimonials from parties who have used them.

WM. READ & SONS, 107 Washington street, Boston: Fine Guns and Sportsman's Outfits. The firm have issued a catalogue showing the Scott, Forehand Arms Company, Colt, Smith, Parker, Ithaca, Greener, Lefever Arms Company, Spencer, Hollenbeck, Pieper, Baker, Charles Daly, Winchester, Burgess and other Guns which they are offering. The catalogue also represents Decoys, Cartridge Belts, Gun Implements, Ammunition Boxes, Gun Cases, Clothing, Fencing Foils and Swords. Rifles, Revolvers, &c. A price-list is also issued relating to Arms and Supplies for G. A. R. posts, Sons of Veterans, schools and military organizations.

ARCADE MFG. COMPANY, Freeport, Ill.: Coffee Mills and Hardware Specialties. Their 1894 catalogue gives illustrations of their varied line of Coffee Mills, Screen Door Hinges, Stove Pipe Dampers, Stove Lid Lifter, Memorandum Hooks, Cork Extractor, Toy Bank and Shovel Scrape. In the introductory to the trade the company state that during the past year they have increased their capital and added largely to their factory facilities, and that they now carry ample stock to enable them to fill all orders promptly. The company also issue a price list and circulars relating to their new Royal Pound Mill, Arcade Stove Pipe Damper and new Arcade Cork Extractor.

It Is Reported—

Delaware.

That W. F. & J. R. Clements' Hardware store, at CLAYTON, was burglarized on the 14th inst.

Idaho.

That R. M. Boggs has sold his Hardware business at BOISE to the Coffin-Northrop Company and the Fletcher-Steen Company. These two firms will divide the stock and remove it to their respective stores. Mr. Boggs will leave shortly for New York, where he expects to reside permanently.

Illinois.

That Skewis & Martin have disposed of their Hardware business, at SCALES MOUND, to John H. McFadden.

That L. E. J. McCabe is closing out his Hardware business at BUSHNELL.

That in a large fire at EL PASO on July 19, the Hardware stock of A. H. White was destroyed. The loss was \$5000; fully insured.

Indiana.

That P. J. Weise & Co. have opened a new Hardware store at UNION CITY.

That W. B. Mount has sold his Hardware store, at DARLINGTON, to Clouser & Buchanan.

Iowa.

That Brown & Bahr, ELKADER, have removed their Hardware stock to new quarters.

That Addy & Hilliary is the style of a new Hardware firm at SHENANDOAH.

That Frank Dixon's Hardware store, at LOHRVILLE, was burglarized on the 7th inst.

That C. R. Keating has succeeded Kirby & Keating in the Hardware business at MOUNT AYR.

That the business portion of ROWLEY was consumed by fire on the 10th inst. The fire originated in the Hardware store of Clayton & Norton, which was entirely destroyed. Their loss was \$4000, with insurance of \$2500.

Kansas.

That C. O. Graves has disposed of his Hardware stock at WASHINGTON to Jas. A. Ayres, Jr., of SIOUX CITY, IOWA, who will continue the business in partnership with his brother.

Michigan.

That Huntom & McCrumb, Hardware merchants, EAGLE, have sold out.

Minnesota.

That Clark & James, dealers in Implements, ORTONVILLE, have dissolved.

That J. B. Grinley has opened a new Hardware and Tin store at KENYON.

That an agreement has been signed by all the Hardwaremen at ST. CLOUD to close at eight o'clock evenings.

That Rushfeldt, Southwell & Co. is the style of a Hardware concern recently organized at HAWLEY.

Missouri.

That Wyeth Hardware & Mfg. Company, ST. JOSEPH, have just completed the purchase of the bankrupt stock of Stoves and Tinner's Supplies of the late firm of Jacob Leu & Sons, ATCHISON, KAN. The purchase was made from the First National Bank at ATCHISON, who held first mortgage on the stock. The stock is being inventoried, and will be consolidated with the company's stock at ST. JOSEPH as soon as the inventory is completed.

Montana.

That J. H. McKnight Company are successors to the Implement firm of J. H. McKnight & Co., GREAT FALLS.

Nebraska.

That W. M. Van Brunt has sold his interest in the Beatrice Hardware Company, BEATRICE, to John A. Forbes.

Ohio.

That the Lucas & Barnett Company, PIQUA, have become the Barnett Hardware Company.

That Hunt & Co.'s Hardware store, at WARREN, was destroyed by fire on the 21st inst.

That Gossman Bros.' Hardware store, at FINDLAY, was robbed on the 10th inst. Razors, Revolvers, Pocket Cutlery and Clippers comprised the booty.

That the Hardware store of Pullman & Parrott, at GREENFIELD, was burned out on the 16th inst.

Oregon.

That the store of Howe & Parrish, Hardware dealers, KLAMATH FALLS, was badly damaged by fire on the 2d inst.

Tennessee.

That John H. Caldwell has bought the stock of Hardware formerly owned by the Bristol Hardware Company, BRISTOL.

Texas.

That R. W. Foat, Hardware and Implement dealer, at WEATHERFORD, is intending to remove to larger and more commodious quarters.

Washington.

That the Puget Sound Hardware & Stove Company have been organized at TACOMA with a capital stock of \$25,000. The incorporators are George D. Hanscomb, J. W. Cloes and Frank De Wall.

That C. V. Lockridge's Hardware store, at AUBURN, was robbed on the 3d inst.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—There is not a distinctly new feature in the market. Grinders are slow about placing orders for Dry Lead, in view of the contest between the National Company and outside corrodors. The fact that crude material is somewhat more costly has had little, if any, effect. Prices are still unsettled and irregular although showing no radical change. Lead in Oil has been in limited demand and prices are still rather easy although showing no decided change. Taken as a whole the advantages are with sharp buyers who are in a position to trade on net cash terms.

Red Lead.—Interest in foreign brands is exceedingly tame. Large consumers are holding aloof pending the settlement of the tariff question and the smaller ones buy in the usual indifferent way. Orders for domestic brands have been very moderate also. Sellers stand out for old prices, however, and show no sign of inclination to prematurely discount a possible change in the tariff.

Litharge.—Nothing more than ordinary business has been done in this article and the buying interest generally is proceeding cautiously. Of low grade some purchases have been made at $4\frac{1}{4}\phi$ @ $4\frac{1}{2}\phi$, but anything above $4\frac{1}{4}\phi$ was the exception. The prices for high grades have not changed, but there is a rather easy tone to the market.

Orange Mineral.—Offerings of foreign brands have been somewhat freer, and some sellers shaded prices to facilitate business in fair sized lots for future delivery, with the effect of giving the market an unsettled appearance. Spot stock, however, is held quite steadily at prices current for some time past.

Zincs.—Some ignorant "fakes" have appeared in print regarding the movement in American Oxide. The simple fact is that business has been moderate and that prices, while not quoted lower, are soft, with more or less leaning in buyers' favor. German and other foreign makes are somewhat irregular in price and selling slowly.

Colors.—In dry Colors there has been a very ordinary trade and that chiefly at former prices, as far at least as high grade goods is concerned. Oil Colors are without important change in price and meet with rather slow sale at present. Ready mixed Paints are without new feature.

Oils and Turpentine.

Linseed Oil.—Beyond ordinary jobbing business nothing has been done, and the demand at present is slow. Crushers offer with some reserve, however, since many mills are closed and the prospects for supply of seed not all that could be desired. Prices have undergone no change during the past week.

Cotton Seed Oil.—Prices of crude product remain steady. Those for refined have undergone no positive change although rather soft. Business has been strictly routine in character and moderate all told.

Lard Oil.—Sales are running rather light, as usual at this season of the year, and the demand is almost wholly for small quantities for immediate delivery. Prices, however, remain quite steady for all grades.

Fish Oils.—No move of any significance has been made in the market for crude Sperm, Whale or Menhaden. Both export and home trade buyers are

holding off for the time being. Dealings in the pressed and bleached products are on a moderate scale also, and chiefly at former prices.

Miscellaneous.—Common Olive Oil in barrels is rather lower, sales having been made at 55ϕ on the spot and 53ϕ @ 54ϕ for future shipment. Coconut

for the purpose, it is explained, of giving the shoe proper shape. The top of the stand is made rounding and upon it the shoe rests when in position, thus, it is stated, preventing the shoe from wedging itself on the stand. The slots in the different size shoes are all made alike and will fit any of the reversible

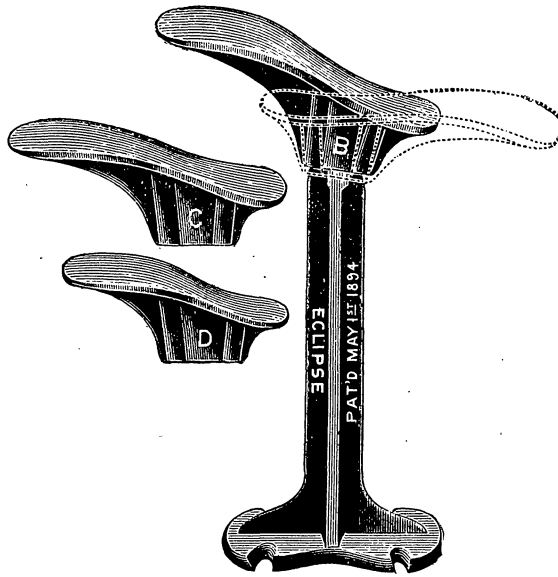


Fig. 1.—Eclipse Reversible Shoe Lasts.

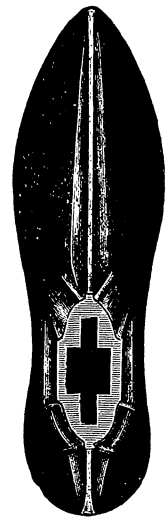


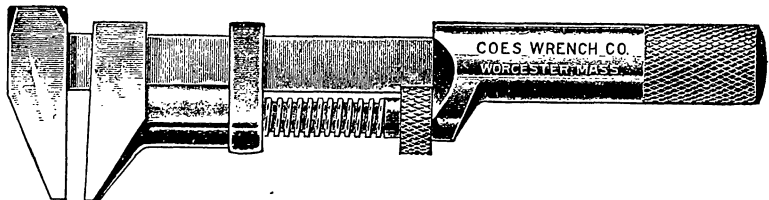
Fig. 2.—Sectional View, Showing Slot in Shoe.

Oils just about hold their own in price, although rather slow of sale. Red Oils are in limited demand and prices continue easy. Neatsfoot is unchanged.

Spirits Turpentine.—Prices have receded about $\frac{1}{2}\phi$ during the week, or to 29ϕ for regular and $29\frac{1}{2}\phi$ for machine barrels. Business has been only fair and the demand at present is rather dull.

Coes Bicycle Wrench.

The Coes Wrench Company, Worcester, Mass., for whom John H. Graham & Co., 118 Chambers street, and J. C. Mc-



Coes Bicycle Wrench.

Carty & Co., 97 Chambers street, New York, are agents, are manufacturing the wrench represented in the accompanying illustration. The tool is especially designed for bicyclists, but is referred to as also well adapted for general use wherever a small wrench is required. The wrench is 5 inches long, will open to take a $\frac{1}{4}$ -inch nut, weighs $6\frac{1}{2}$ ounces and is entirely nickel plated. Its strength and durability are specially emphasized by the manufacturers. A patent on the wrench has recently been obtained.

The Eclipse Reversible Shoe Lasts.

John C. Kupferle, Second and Mound streets, St. Louis, Mo., is putting on the market the Eclipse reversible shoe lasts, which are represented in the accompanying illustrations. The stand is japanned and is made wedge shape

stands. The stand shown in Fig. 1 is 15 inches high, and the weight of the set represented is 10 pounds.

The Berry Clothes Sprinkler.

This sprinkler is shown herewith and is put on the market by the Berry Sprinkler Company, Boston, Mass. The sprinkler fills automatically, absorbing the contents when placed in a bowl or basin of water. The manner in which it is used is obvious, a slight quick motion of the device precipitating some of its contents. The device is intended

for use in connection with the ironing of clothes, permitting one to iron them immediately after sprinkling, if desired. For starched clothes its use is referred to as especially satisfactory. It may also be used as a sprinkler for



The Berry Clothes Sprinkler.

house plants and for laying the dust while sweeping. It can also be utilized in the sick room where liquid disinfectant is employed, and it is stated that it is now being used for that purpose in some hospitals.

Black Diamond Cutlery.

Horton, Gilmore, McWilliams & Co.,
172 to 176 Lake street, Chicago, are
putting on the market a line of butcher,

sentative of Priestley Express Wagon
& Sleigh Company, Grand Rapids,
Mich., informs us that the company this
year are making an increased line of
Sleds for this season's trade, and that
the samples of the new patterns will be

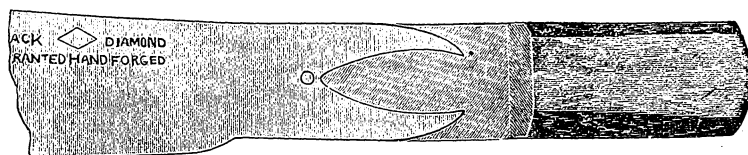


Fig. 1.—Beech Handled Knife.

sticking, skinning, bread, kitchen, fish
and carving knives, made specially for
them and of their own designs, branded
Black Diamond. These knives have
special points which are worthy of
notice and illustration. The manner in
which the blades are fastened in the
handles is unique. Fig. 1 shows their
beech handled knife with the handle
cut away, exposing the forked tang,
which is driven into a slot in the handle

ready about August 1. A new cata-
logue of the company, recently noticed
in these columns, illustrates and de-
scribes the various styles.

The Diamond Hair Curler.

An illustration is herewith presented
of the new Diamond hair curling iron,

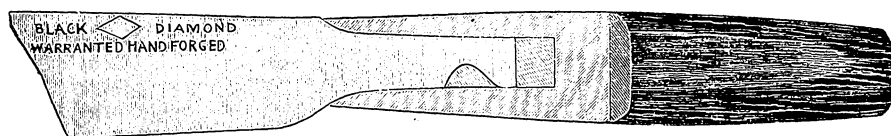


Fig. 2.—Bolstered Knife with Handle Cut Away.

and then fastened by a rivet, as indicated
in the cut. The advantages claimed for
this method of fastening are that the
blade will not get loose and the handle is
also made lighter and better balanced
than by other modes of fastening.
Figs. 2 and 3 show the bolstered knife.
Fig. 2 is a view of one of the handles
cut away to show the method of fasten-
ing. The bolstered knives have a

manufactured by the Geo. L. Thomp-
son Mfg. Company, 6126 to 6130 La
Salle street, Chicago. The spring of
this curler is located at the handle ends,
and is therefore not affected by the
heat, so that its temper will not be
drawn even in constant use, nor is
there any danger of the spring breaking,
as there is very little pressure on it. It
can be opened wider than the curling

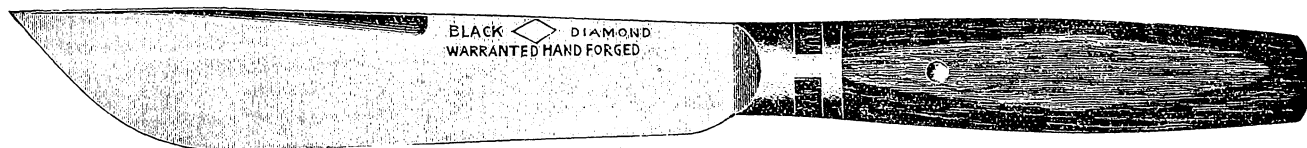
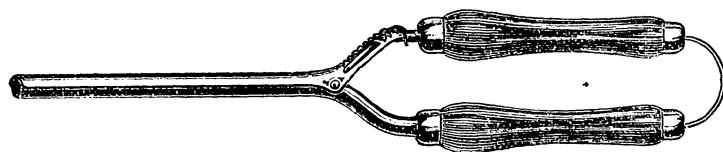


Fig. 3.—Bolstered Knife Complete.

notched tang. The handle is bored and
the blade is then fitted in while hot.
Molton composition metal is then poured
in around the tang, which fills the
cavity and firmly binds the tang in its
socket. Fig. 3 shows a completed knife
with a bolstered handle. Care is taken
to secure the very best quality of shear
steel for the blades, and they are strictly

irons in common use, but is prevented
from opening too wide by a projecting
wire from one of the handles which fits
into a hole in the end of the pivoted
jaw. On pressing the handles the jaws
open, and the wire is forced through
the hole until it touches the opposite
jaw, which prevents the curler from
being opened any further. Three sizes



The Diamond Hair Curler.

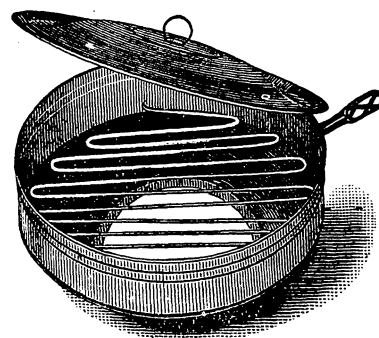
hand forged. They are made to meet
the demand for a cheap but honestly
made first-class knife that will keep its
edge.

HORACE F. SISE, 114 Chambers
street, New York, and Eastern repre-

are made, which are respectively named
Diamond, Pearl and Ruby. All are
highly polished and nickel plated and
are fitted with handsomely polished an-
tique oak handles. They are sold to
the trade by Horton, Gilmore, McWill-
iams & Co. of Chicago, and other lead-
ing jobbing houses.

The Lebanon Broiler.

Seltzer Specialty Company, Lebanon,
Pa., are manufacturing this article, of
which an illustration is given herewith.
The broilers are described as made of
best bright tin, with sheet steel bot-
toms. The bottoms are tapered so that
drippings will not grease the stove. The
broilers are large enough to take in
roasting ears, chicken, fish, &c., and



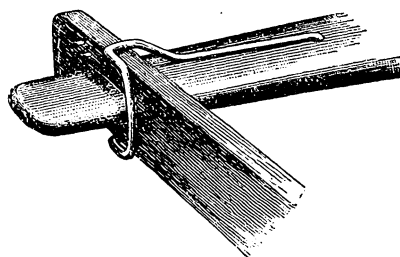
The Lebanon Broiler.

may be successfully used for roasting
potatoes, apples, &c., over the fire. The
broiler is also referred to as making
an excellent steam cooker, for which
purpose it is placed over a kettle of boil-
ing water. In this way puddings,
dumplings, vegetables, &c., may be
cooked in it. The broilers are 11 inches
in diameter and 3½ inches deep.

Stalford Tug Fastener.

Stalford Tug Fastener Company, Des
Moines, Iowa, are offering a new tug
fastener, as shown in the illustration.
It consists of a single piece of brass or
steel spring wire, polished and nicked,

formed into a loop and attached to the
single tree so as to swing forward and
back. It rests on the top and bottom
of the single tree when the tugs are
hitched, being securely held in place by
the elasticity of the wire. The fastener

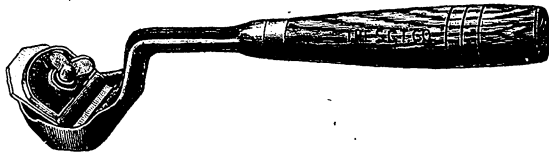


The Stalford Tug Fastener.

is mounted by boring a ⅜-inch hole in
the single tree and forcing the long arm,
2 inches long, down through the wood,
while the short arm, ¾ inch in length,
is pushed up from beneath. The long
arm (both being semicircular) is then
clinched over the end of the short arm
and the end filed off underneath.

Tatum's Box Scraper.

The box scraper represented in the accompanying cut is being introduced by the Samuel C. Tatum Company, Cin-



Tatum's Box Scraper.

cinnati, Ohio. The manufacturers remark that the wood handle insures a firm grasp and that it is sufficiently raised to work all over a barrel head and still clear the knuckles. The thumb screw gives a ready adjustment to the blade, which can be quickly removed for sharpening.

Buhl Side Lift Lanterns.

Buhl Stamping Company, Detroit, Mich., are putting on the market the lanterns represented in the accompanying illustrations, which are a recent addition to their line. By the use of the thumb and forefinger in the manner indicated in Fig. 1, the disk, guard and globe may be lifted entirely free from the burner and as readily returned to place. It is pointed out that the patent side lift securely locks the globe in

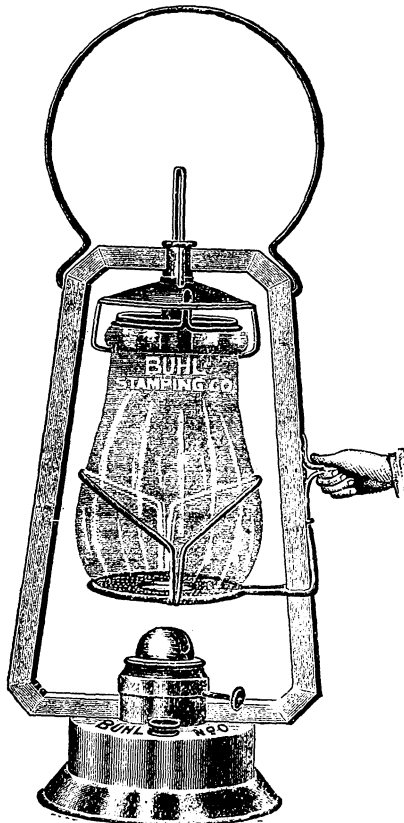


Fig. 1.—Buhl Side Lift Lantern No. 15.

position when raised or lowered, and that the burner is always locked when the lantern is in use. Fig. 2 represents the company's side lift contractor's lantern, which is offered with ruby globe, and which on account of its strong construction, simplicity and few separable parts is specially recommended for street and railroad purposes, or wherever a

signal lantern is required. These lanterns are equipped with the company's braced square tubes, made from a single piece of tin, non-detachable basket guard and tested oil well. The latter, it is stated,

can be filled, lighted and regulated without removing the globe. It is claimed that these lanterns will burn 20 hours without refilling, and that

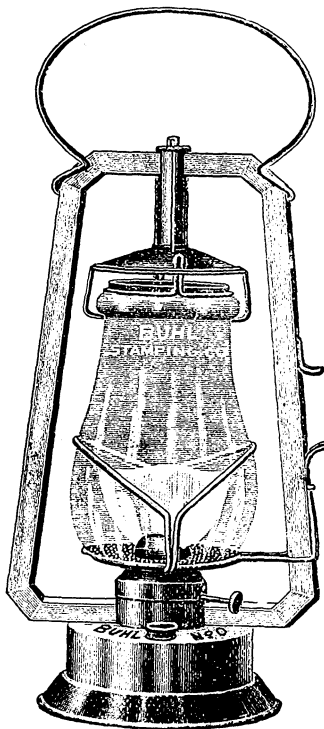
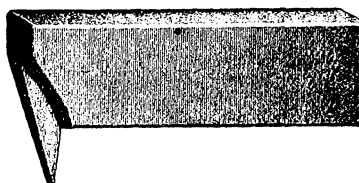


Fig. 2.—No. 159 Contractors' Lantern.

they can be easily manipulated by a child or a one-armed man.

Toe Calk.

Union Toe Calk Company, 338 West First street, South Boston, Mass., are putting on the market a new toe calk, which is shown in the accompanying illustration. The calk is described as made of both American and English steel, hot forged by a patented machine specially designed for the work, and the method of manufacture is re-



Toe Calk.

ferred to as a copy of the old hand process, retaining, it is claimed, all of its excellent features and turning out the calks uniform and rapidly. The calks are made in all sizes and in varying lengths.

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Current Hardware Prices.

JULY 25, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic.....\$ doz \$3.00, 33% @ 33% & 10%
Excelsior.....\$ doz \$10.00.....50 & 10 & 2%
North's.....\$ doz \$10.00.....11 @ 11%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—

Agile Anvils, \$ 24.....15 @ 15 & 5%
Horse shoe brand, Wrought.....11 @ 11%
Moore & Barnes Mfg. Co.....33%

Imported—

Armitage Mouse Hole.....9% @ 10%
S. & H. machine finished.....10% @ 11%
Trenton.....9% @ 10%
Wilkinson's.....10% @ 10%
Peter Wright's.....10% @ 11%

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40 & 10%
Cheney Anvil and Vise.....25%
Millers Falls Co., \$18.00.....20%
Holt's.....40 @ 40 & 10%

Apple Parers—See Parers

Augers and Bits—

Boring Machine Augers.....70 @ 70 & 10%
Car Bits, 12-in. twist.....50%
Common Augers and Bits.....70 @ 70 & 10%
Cincinnati Bell-Hangers' Bits.....30 & 10
Vorster Pat. Auger Bits.....15%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
J. E. Jennings & Co., No. 10, extension
lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, set
32% quaters, No. 5, 8, 10, No. 30, \$3.50, 25%
Russell Jennings' Augers and Bits, 25 & 10%
Lewis' Patent Single twist.....45%
L'Hommedieu Car Bits.....15 & 10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....20%
Snell's Bits.....60 & 5 @ 60 & 10%

Bit Stock Drills—

Cleveland.....50 & 10 & 5%
Cincinnati, for wood.....30 & 10%
Cincinnati, for metal.....45 & 10%
Morse Twist Drills.....50 & 10 & 5%
New Process Twist Drill Co.....50 & 10 & 5%
Standard.....50 & 10 & 5%
Syracuse, for metal.....50 & 10%
Syracuse, for wood (wood list), 30 & 30 & 5%

Expansive Bits—

Clark's small, \$18, large, \$26.....40 @ 40 & 5%
Ives' No. 4, \$ doz, \$20.....40 @ 40 & 10%
Steer's, No. 1, \$28; No. 2, \$18.....40 @ 40 & 5%
Stearns' No. 2, \$48.....20%
Swan's.....40 @ 40 & 10%

Gimlet Bits—

Bee.....25 @ 25 & 10%
Common.....\$ doz \$2.50 @ 25 & 10%
Diamond.....\$ doz \$1.25.....40 & 10%
Double Cut:
Hartwell's.....\$ gro., \$10.00, 40 & 10%
Douglass'.....40 & 10 @ 50%
Ives.....60 & 10 @ 60 & 10%
Shepardson's.....45 & 10 @ 45 & 10 & 5%

Hollow Augers—

Bonney's Adjustable, \$ doz \$48.....50%
Cincinnati Adjustable.....25 & 10%
Cincinnati Standard.....25 & 10%
Douglass'.....33% @ 33% & 10%
French, Swift & Co. (Beecher).....33% @ 33% & 10%
Ives'.....33% @ 33% & 10%
Ives' Expansive, each \$4.50.....50 & 5%
Stearns'.....20 & 10%
Universal Expansive, each \$4.50.....20%
Wood's, \$ doz, \$48.....25 & 10%

Ship Augers and Bits—

L'Hommedieu's.....15 & 10 @ 15 & 10 & 5%
Snell's.....25 @ 25 & 10%
Snell's Ship Auger Pattern Car Bits.....15 & 10 @ 15 & 10 & 5%
Watrous'.....25 @ 25 & 10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled.....\$ gr. \$2.50 @ \$3.00
Brad, Shouldered.....\$ gr. \$1.30 @ \$1.40
Peg, Flat.....\$ gr. 35 @ 38%
Peg, Shouldered.....\$ gr. \$1.50 @ \$1.55
Scratch, Handled.....\$ gr. \$4.00 @ \$4.50
Scratch, Socket.....\$ doz. \$1.10 @ \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$6.00 @ \$8.50
First quality, other brands.....5.50 @ 6.00
Beveled add 50¢ doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common.....34 @ 34%
No. 2 Common.....44 @ 44%
Nos. 7 to 14.....70%
Nos. 15 to 23.....47%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....40 @ 40%
Concord Axles, solid collar.....50 @ 50%
Tubular Axles.....50%

Bag Holders—See Holders, Bag.

Balances—

Sash—
Caldwell, low list.....30%
Pullman.....60%

Spring—

Spring Balances.....40 & 10 @ 5%
No. 2000 20 30
Chatillon, \$ doz.....\$0.80 0.95 1.75 net
Chatillon Straight Balances.....40 @ 40 & 10%
Chatillon Circular Balances.....50 & 10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel.....\$ 2 24 @ 34%
Iron, Steel Points.....\$ 2 24 @ 34%

Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2-in., \$1.80;
12-in., \$2.00; 18 1/2-in., \$2.50; 15-in.,
\$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '83, 60 & 10%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50 & 10 @ 50 & 10 & 5%
Custer's.....33%

Beaters—

Egg—
Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$38.00
Dover.....\$ doz \$1.00 @ \$1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.00
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$2.25 @ \$2.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%

Bells—

Cow—
Common Wrought.....60 & 10%
Kentucky Durham.....70 & 10%
Kentucky, Sargent's list.....70 & 10%
Kentucky, "Star".....20 & 10%
Texas Star.....50 & 10 @ 50 & 10 & 5%
Western, Sargent's list.....70 & 10%

Door—

Crank, Brooks'.....50 & 10 & 2%
Crank, Cone's.....10%
Crank, Connel's.....20 & 10%
Gong, Abbe's.....33% @ 34%
Gong, Barton's.....40 & 10 @ 50%
Gong, Yankee.....45 & 10%
Lever, R. & E. Mfg. Co.'s.....50 & 10 & 2%
Lever, Sargent's.....60 & 10%
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanese.....25 & 10%
Pull, Brook's.....50 & 10 & 2%

Electric—

Bigelow & Dowse.....20 @ 20 & 10%
Wollensak's.....20 @ 20 & 10%

Hand—

Extra Heavy Brass.....70%
Light Brass.....70 & 10 @ 70 & 10 & 5%
Silver Chime.....33% @ 34%
White.....60 & 10%
Globe Cone's Patent.....25 & 10 @ 35%

Miscellaneous—

Call.....45 @ 50%
Farm Bells.....\$ 2 24
Steel Alloy Church and School Bells.....50%

Bellows—

Blacksmiths'.....60 & 10 @ 70%
Hand Bellows.....40 & 10 @ 50%
Molders'.....40 & 10 @ 50%

Belting, Rubber—

Common Standard.....75 & 10 @ 75 & 10 & 5%
Extra.....60 & 10 @ 70%
Standard.....70 & 10 @ 75%
N.Y.B. & P. Co., Carbon.....60 & 10 & 5%
N.Y.B. & P. Co., Double Diamond.....60%
N.Y.B. & P. Co., 1846 Para.....40 & 10%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 15 @ 15 & 10%
Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....50 & 10 @ 60 & 10%
Moore's Novelty, Mal. Iron.....50 @ 50 & 5%
Saw Grip Steel Blocks, 25 @ 25 & 10%
See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....80 & 10 @ 80 & 10 & 5%
Charter Oak, list Oct. 1, 1884.....80%
Genuine Eagle, Norway, list Oct. '84.....80 & 5 @ 80 & 10%
Eagle, Norway, list Oct. '84.....80 & 5 @ 80 & 10%
Phila. pattern, list Oct. 7, '84.....80%
R.B. & W., old list.....70%
Bolt Ends, list Jan. 1, 1890.....80 & 10 @ 80 & 20%
Machine, list Jan. 1, 1890.....80 & 10 @ 80 & 20%

Door and Shutter—

Cast Iron Barrel Square, &c.....75 & 10 @ 75 & 10 & 5%
Cast Iron Chain (Sargent's list).....65 & 10 @ 65 & 10 & 5%
Cast Iron Shutter Bolts.....75 & 10 @ 75 & 10 & 5%
Ives' Patent Door Bolts.....60 & 10 @ 60 & 10 & 5%
Wrought Barrel.....75 & 10 @ 80%
W.R. B. K. Flush Common.....60 & 10 @ 60 & 10 & 10%
W.R. Shutter, Brass Knob.....50 & 10 @ 50%
W.R. Shutter, Sargent's list.....60% @ 70%
W.R. Shutter, all iron, Stanley's, 60% @ 70%
Wrought Square.....75 & 10 @ 80%
W.R. Sunk Flush, Sargent's list.....60 & 10%
W.R. Sunk Flush, Stanley's list.....60 @ 60 & 10%

Stove and Plow—

Plow.....60 & 10 @ 60 & 10 & 10%
Stove.....65 @ 70%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....70 @ 70 & 10%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....70%
Franklin Moore Co.
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Eclipse, list Feb. 28, '83.....70%
Port Chester Bolt and Nut Company
Empire list Feb. 28, '83.....70%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
R. B. & W., Philadel., list Oct. 16, '84.....75%

Borers, Tap—

Common and Ring.....20 & 10%
Clark's.....33% @ 35%
Enterprise Mfg. Co.....25%
Ives' Tap Borers.....33% @ 35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's.....40

Boxes, Wagon—

Per doz.....24%

Boxes, Miter.

Spilker's Excelsior, 3 in. \$7.50, 4 in.
\$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

Braces—

NOTE.—Most Braces are sold at net prices.
Barber's.....50 & 10%
Bartholomew's.....50 & 5%
Common Rail, American.....\$1.00 @ \$1.10
Davis Patent.....60 & 10%
Fray's Genuine Spofford's.....50 & 10 & 5%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414
50 & 10 & 5%
Ives' New Haven Novelty.....70 @ 70 & 5%
New Haven Hatchet.....60 & 5 @ 60 & 10%
Barber Hatchet.....60 & 5 @ 60 & 10%
Barber's.....60 & 5%
Spofford.....60 & 5 @ 60 & 10%
P. S. & W. Co., Peck's Patent.....80%
Rose & Johnson.....50%

Brackets—

Shelf, fancy, Sargent's list.....70 @ 70 & 10%
Other makes at a wide range of prices.
Shelf, plain, Regular, list.....65 @ 70%
Sargent's list.....60 & 10 @ 70 & 10%
Bradley Shelf Brackets.....70 & 10%

Bright Wire Goods—See Wire.

Brollers—

Hemis Self-Inch.....9 10 9x11
Basting Per doz.....\$4.50 5.50 6.50
Morgue Adorless.....\$ doz \$12, 60%
New Haven.....33%
Queen City.....33%
Wire Goods Co.....65 & 10%

Buckets, Well and Fire—See Pails, Galvanized.

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butcher's.

Butts—

Brass—
Cast Brass, Fast.....33% @ 10%
Cast Brass, Loose Joint.....33% @ 10%
Cast Brass, Tiebout's.....50%
Wrought Brass.....80 & 10 @ 80 & 20%

Cast Iron—

Fast Joint, Broad.....60 & 10 @ 60 & 10 & 10%
Fast Joint Narrow.....60 @ 60 & 10%

Loose Joint.....

Loose Joint, Japanned.....75 & 10 @ 80%
Loose Joint, Jap. with Acorns.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned.....
Loose Pin, Acorns, Japanned,
Plated Tip.....
Mayer's Hinges.....
Parliament Butts.....

Wrought Steel—

Fast Joint, Broad.....
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Inside Blind, Light.....
Inside Blind, Regular.....
Loose Joint, Broad.....
Loose Pin.....
Table Butts, Back Flaps, &c.....
Bronzed Wrought Butts.....50 & 10 @ 50 & 10 & 5%

Cages, Bird—

Hendryx Brass:
3000, 5000, 1100 series.....10%
1200 series.....40%
200, 300, 600 and 900 series.....40 & 10 @ 50%
Hendryx Bronze:
100, 200 series.....40 & 10 @ 50%
Hendryx Enameled.....40 & 10 @ 50%

Callipers—See Compasses.

Calks, Toe—

Burke's, One Prong, Blunt.....40 @ 40%
Burke's, One Prong, Sharp.....50 @ 50%
Burke's, Two Prong, Blunt.....50 @ 50%
Burke's, Two Prong, Sharp.....50 @ 50%
Gautier, One Prong, Blunt.....50 @ 50%

CanOpeners—See Openers, Can.

Cans Milk—

S. & Co., 5-gal., \$3.00; 3-gal., \$4.40;
10-gal., \$4.75 each.....40 & 10

Cans Oil—

Galvanized Blue Band, 1 gal., \$ doz, \$2.35
Galvanized Blue Band, 5 gal., 70¢, Tip-Top,
\$ doz, \$15.00
Galvanized Blue Band, 5 gal., Faucet,
\$ doz, \$8.00
Glass Oil, Friend.....\$ doz \$3.75

Caps—Percussion—

Hicks & Goldmark's and Union Metallic
Cartridge Co.....\$1.00
Eley's E. B.....\$1.00
Eley's D Waterproof, Central Fire, \$1.50
E. B. Grand Edge, Cent. Fire, 1-10's, 47 @ 50%
E. B. Trimmed Edge, 1-10's.....47 @ 50%
F. L. Waterproof, 1-10's.....35 @ 37%
G. D.....27 @ 30%
Musket, Waterproof, 1-10's.....50 @ 50%
S. B. Genuine Imported.....25

Primers—

Berdan Primers, \$1.00.....25
B. L. Caps (Sturtevant Shells) \$1.00.....25
All other Primers, \$1.30.....25

Cards—

Watson's Cotton, Wool, Horse and
File, list January 28, 1891.....25%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Coll. Ball, Swgd., \$1.85 @ \$1.90
B. B. Caps, Round, \$1.00 @ \$1.05
Blank Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.
Blank Cartridges, 22 cal., \$1.75.....25
Blank Cartridges, 32 cal., \$3.50.....25
Cent. Fire, Military and Sporting 15 & 25
Cent. Fire, Pistol and Rifle.....25 & 25%
Primed Shells and Bullets.....15 & 25%
Rim Fire Cartridges.....60 & 5%
Rim Fire Military.....15 & 25%

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed.....Brass.....55 @ 55 & 10%
Plate.....Others.....60 @ 60 & 10%
Shallow Socket.....40 & 10%
Deep Socket.....40 & 10%
Giant Truck Casters.....55%
Gwinner's Common Sense.....45 @ 50%
Gwinner's Hercules.....45 @ 50%
Martin's Patent (Phoenix) 45 & 10 @ 50 & 10%
Payson's Anti-friction.....70 @ 70 & 10%
Payson's Truck.....60 @ 60 & 10%
Socket Truck Casters.....50 & 50 & 10%
Stationary Truck Casters.....50 & 10%
Trucker's Patent low list.....45%
Yale Casters, low list.....45%
Yale, Gem.....70%

Cattle Leaders—

See Leaders, Cattle.

Cement—

Victor Elastic.....5 lb pails \$ 2

Chain—

American Coll. in case lots,
3-16 3-16 7-16 3-16 3-16
\$7.00 5.50 4.45 3.

Chalk Lines—See Lines.**Checks, Door—**

Bardsley's.....20%

Chisels—**Socket Framing and Firmer**

Ohio Tool Co.....75&100&50%

Chisels—

P. S. & W.....30%

Wetherby.....30%

Buck Bros.....30%

Charles Buck.....30%

Douglass.....75&75&100%

Merrill.....60&100&80&100%

L. & J. White.....90&90&50%

Tanged and Miscellaneous

Buck Bros.....30%

Charles Buck.....30%

Butchers.....\$4.75&\$5.00 to 2

Spear & Jacksons.....\$5 to 2

Tanged Firmers.....50&50&100%

L. & J. White, Tanged.....25&50%

Cold Chisels, fair quality, # 14 to 16.....14 to 16

Chucks

Beach Pat.....each, \$8.00.....20%

Danbury.....each, \$8.00, 30.00&50%

Graham Patent.....35&40%

Morse's Adjustable, each, \$7.00, 20.00&25%

Syracuse, Bais Pat.....25%

Klappner Patent Chucks.....40%

Combination Lathe Chucks.....25%

Drill Chucks.....25%

Independent Lathe Chucks.....40%

Planer Chucks.....20%

Universal Lathe Chucks.....40%

Union Mfg. Co.....40%

Combination.....40%

Independent.....40%

Universal.....40%

Victor.....\$8.50, 25%

Churns—

Modernized Star Barrel Churn, each

0 gal., \$2.50; 10 gal., \$2.75; 15 gal.,

\$3.00; 20 gal., \$3.25; 25 gal., \$3.50;

Tiffin Union, each, 5 gal., \$3.25; 7 gal.,

\$3.75; 10 gal., \$4.25.

Clamps

Adjustable, Cincinnati.....15&10%

Adjustable, Hammers.....15&15&50%

Adjustable, Stearns.....30&80&100%

Barnes' Machinists' Clamps.....35&40%

Carpenter's, Cincinnati.....70&100%

Carpenter's, Cincinnati.....25&10%

Carriage Makers', P. S. & W. Co., 40&10%

Carriage Makers', Sargent's.....75&75&50%

Eberhard Mfg. Co.....40&50&100%

Joiners' Clamps, Tatum's.....25&10%

E. I. Tool Co.'s Wrought Iron.....25%

Saw Clamps, see Vise, Saw Fillers

Stearns' Malleable, each, 75&75&50%

Warner's.....40&100&40&100%

Cleavers, Butchers—

Beatty's.....40&50&40&100%

Bradley's.....25&30%

Foster Bros.....30%

New Haven Edge Tool Co.'s.....40%

Nichols Bros.....30%

P. S. & W.....35&45&35&10%

Schulte, Lohoff & Co.....40&40&50%

L. & J. White.....25%

Clips

Baker Axle Clips.....25%

Norway, Axle.....65&100&50%

Norway Sp. Bar Clips.....65&65&50%

2nd grade Norway, Axle.....25&25%

Steel Felloe Clips.....25&25%

Superior Axle Clips.....25%

Wrought Iron Felloe Clips.....# 1, 5&4%

Cloth and Netting, Wire

—See Wire, &c.

Cockeyes

—See Wire, &c.

Cocks, Brass—

Hardware list (Globe, Kerosene, Lever

Ehbs, Racking, &c.).....60&2&60&10

Coffee Mills—See Mills, Coffee**Colars**

Brass, Pope & Stevens' list.....40%

Chapman Mfg. Company, new list.....40%

Embossed, Gift, Pope & Stevens' list.....30&100%

Leather, Pope & Stevens' list.....40%

Medford Fancy Goods Co.....40&100&50%

Combs Curry

American Curry Comb Co.....35&40%

Fitch's.....50&100&50&100%

Gibb's Magnesian.....\$ doz., \$2.00

Kohler's Humane.....\$ doz., \$1.75

Kohler's Magic Oscillating.....\$ doz., \$2.00

Rubber, per doz., \$1.00.....25%

Compasses, Calipers, Dividers.....70&100&75%

Bemis & Call Co's.....65%

Dividers.....65%

Calipers, Call's Patent Inside.....65%

Calipers, Double.....65%

Calipers, Inside or Outside.....65%

Calipers, Wing.....60%

Compasses.....50&50%

Excelsior.....50%

Stearns' Combination Dividers.....25%

Lock Calipers and Dividers.....25%

Spring Calipers and Dividers.....25&10%

Stevens & Co's.....25&10%

Coolers, Water—

B. S. & Co.: 2-gal., \$3.40; 8-gal., \$1.00;

4-gal., \$4.50; 6-gal., \$5.60 each.....60%

Coopers' Tools—

See Tools, Coopers'.

Cord Sash—

Braided, Crown Drab and Fancy, #

B, 55&.....80%

Braided, Crown White, # B, 50&.....50%

Cable Laid Italian Sash.....# B, 10&20&

Common.....# B, 8&9&90%

Common Russia Sash.....# B, 12&13&

Egyptian, India Hemp, Braided.....25%

India Cable Laid Sash.....# B, 11&12&

Massachusetts, White.....# B, 22&24&

Osawaun Mills—

Crown, Solid Braided White, # B, 2&2

Crown, Drab and Fancy.....# B, 2&2

Braided Giant, Drab and Fancy.....# B, 20&

Braided, Giant, White.....# B, 20&

Patent, good quality.....# B, 10&11&

Patent, Russia Sash.....# B, 13&14&

Ransom—

Braided, Drab Cotton.....# B, 42&

Braided, Italian Hemp.....# B, 40&

Braided, Linen.....# B, 56&

Braided, White Cotton.....# B, 57&

Super Idem, Braided, White.....28&

Silver Lake—

A quality, Drab, 55&.....25%

A quality, White, 50&.....25%

B quality, Drab, 35&.....10%

B quality, White, 30&.....10%

Sylvan Spring, Extra Braided, Drab.....38&

Sylvan Spring, Extra Braided, White.....38&

Tally's Solid Braided—

Syracuse, Drab.....# B, 27&

Conomy, White.....# B, 23&

Hercules, Drab.....# B, 30&

Hercules, White.....# B, 25&

White Cotton Braided, fair.....# B, 23&24&

Wire Picture—

Braided or Twisted.....30&100&80&20%

Corkscrews—See Screws, Cork.**Corn Knives and Cutters**

—See Knives, Corn.

Crackers, Nut—

Acme.....\$ gro., \$30.....50%

Nickel Plated, # gro., \$30.....10%

Table (H. & B. Mfg. Co.).....40%

Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&2&50&5&2&

Crays—

White Crays, # gross.....\$ 6&6&4

Cases, 100 gr., \$3.75&\$4.25, at factory.

D. M. Steward Mfg. Co.....

Metal Workers' # gross, \$2.50, 20.00&25%

Railroad, # gross.....2.00, 20.00&25%

Rolling Mill, # gross.....2.50, 20.00&25%

Soapstone Pencils, # gross, 1.50, 20.00&25%

See also Chalk.

Creamery Pails—See Pails, Creamery.**Crow Bars—See Bars, Crow.****Curry Combs—**

See Combs, Curry.

Cutters—**Meat—**

American.....30%

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 9

Brooklyn Latches.....50&10%
Deltz Flat Key.....30%
Mallory, Wheeler & Co. list July, '88..
60&10@70%

Plate.....45¢
Bower's Night Latches.....15¢
R. & E. Mfg. Co., list Mar. 30, 1893.....60¢
Sargent & Co., list July, 1894.....60¢
Warner's Burglar Proof.....\$8.00, 50¢

Elevator—

Moore's.....88¢

Padlocks—

Wrought Iron Padlocks:
Brittan, Graham & Mathes, list
 Jan., 1894.....75¢
Mallory, Wheeler Co., list Jan. 1,
 1894.....75¢
Norwich Lock Mfg. Co., list June
 10, 1891.....50¢
Russell & Erwin Mfg. Co., list June
 10, 1891.....50¢
Sargent & Co., list January 1, 1894
 75¢
William Wilcox Mfg. Co., list Janu-
 ary 1, 1894.....75¢
Ames Sword Co. up to No. 108 incl.
Ames Sword Co. above No. 108.....50¢
Barnes Mfg. Co......40¢
Champion Padlocks.....40¢
A. E. Deitz.....40¢
Eagle.....40¢
Eureka, Eagle Lock Co......40¢
E. T. Fram's Keystone Scandinavian
 1010 line.....50¢
 120 line.....65¢
 109 line.....70¢
 510 line.....70¢
 225, 610 and 209 lines.....70¢
 All other numbers.....50¢
Horsehoe.....\$9.50
Kotchias.....30¢
Koch's.....30¢
Romer's No. 6 to 91.....30¢
Romer's Scandinavian, &c., Nos. 100 to
 508.....15¢
Scandinavian.....90¢
Maymaker, Barry & Co.
 No. 1010 line.....90¢
 No. 41 line.....50¢
 No. 61 line.....60¢
 No. 21 line.....70¢
 No. 109 line.....90¢
Star.....60¢
Yale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Attwell Mfg. Co......25¢
Champion Safety list January, 1893.....70¢
Clark's No. 1, 10, No. 2, 3, 4, 5, 6, 7, 8, 9, 10
 Common Sense, Jap'd, Cop'd and
 Br'ed.....\$4.00
Common Sense, Nickel Plated.....\$10.00
Corbin's Daisy, list Feb. 15, 1888.....70¢
Davis Bronze, Barnes Mfg. Co......60¢
Ferguson's.....38¢
Fish (Liesche's pat.), No. 100, gr. 38
 No. 105, gr. 10.....60¢
Giant, list Jan. 1892.....70¢
Hammond's Window Springs.....25¢
Hugunin's New Sash Locks.....25¢
Hugunin's Sash Balances.....25¢
Ives' Patent.....60¢
Kempshall's Gravity.....60¢
Kempshall's Model.....60¢
Monarch.....60¢
Payson's Perfect.....60¢
Reading.....60¢
Security.....70¢
Universal.....30¢
Victor.....60¢
Walker's.....10¢
Wolcott's.....60¢

Lumber Tools—

See Tools, Lumber.
Lustro—
 Four-ounce bottles.....\$1.75
 gross.....\$17.00

Machines.

Boring—

Without
Augers, Upright, Angular.
Boss, Carpenters' 3.60
Boss, Ship Bldrs' 3.85
Douglas.....\$5.50
Jennings.....5.50
Miller's Falls.....7.50
Phillip's Patent
 with Auger.....7.00
Snell's, Rice's Pat 5.50.....6.75

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
 \$4.50 each.....35¢
Combined Fluter and Sad Iron.
 \$15.00 each.....30¢
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
 \$6.50 each.....35¢
Crown Hand Fluter, Nos. 1, \$15.00; 2,
 \$12.50; 3, \$10.00; 4, \$8.25.....35¢
Crown Jewel, 6 in......\$8.50 each, 35¢
Domestic Fluter.....each, 35¢
Eagle, 8 1/2-inch Rolls, \$2.15.....35¢
Eagle, 6 1/2-inch Rolls, \$2.85.....35¢
Knox, 4 1/2-inch Rolls.....\$3.25 each, 35¢
Knox, 6-inch Rolls.....\$3.50 each, 35¢

Hoisting—

Moore's Anti-Friction Differential Pul-
ley Block.....20¢
Moore's Hand Hoist, with Lock Brake.....20¢
Moore's Rope Differential Pulley
 Block.....60¢
Maria & Beekley (Teal Patent).....30¢
 See also Blocks.

Washing—

Fair and Square.....\$42.00
Anthony Wayne.....\$42.00
 No. 3, \$36; No. 3, \$42.
Wayne American.....\$38.00
Welsch.....\$54.00
Western Star.....\$36; No. 3,
 \$39

Mallets—

B. & L. Block Co., Hickory & L. V.
 30x10x10.....33¢
Vibre Head, Stearns.....33¢
Hickory.....20x10x20x10x10
Lignum vitae.....20x10x20x10x10

Mattocks—Regular list.

60x10x60x10x5

Measures—

Standard Fibreware, No. 1, peak.....\$3.50
 dozen, \$3.50; 14-peak, \$3.00

Meat Cutters—

See Cutters, Meat

Menders—

Harness.....\$1.75
Hudson's Hose Menders, in set, per doz.
 \$8.00
Milk Cans—See Cans, Milk.

Mills—

Box and Side, list Jan. 1, 1888.....60¢
 Net prices are often made which are
 lower than above discount.
American, Enterprise Mfg. Co., list Jan.
 1, 1888.....20¢
National list, Jan. 1, 1894.....30¢
Swift, Lane Bros......30¢
Waddell's New Box Mills, Ideal
 Brand, New List.....60¢
Mining Knives—
 See Knives, Mining.
Molasses Cates—
 See Gates, Molasses.
Money Drawers—
 See Drawers, Money.

Mowers, Lawn—

Highest 10 in......12 in.
 grade, \$4.00 to \$5.25
 Good.....\$3.00
 Cheap.....\$2.25
Muzzles—
 Safety.....\$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
 Association list, May 1, '92.....85¢
Hungarian, Finishing, Upholsterers', &c.
 See Tools.

Horse—

Nos. 6 7 8 9 10
A. C......25¢
American.....9¢
Anchor.....25¢
Ausable.....25¢
Capwell.....19¢
O. B. K......25¢
Champion.....25¢
Champlain.....25¢
Clinton, Fin......19¢
Empire Bronze.....11¢
Essex.....25¢
Lyra.....9¢
Maud S......25¢
Northwestern.....25¢
Putnam.....25¢
Snowden.....9¢
Standard.....25¢
Vulcan.....25¢
Western.....25¢

Picture—

Brass Head, Combination list.....50¢
Brass Head, Sargent's list.....60¢
Porcelain Head, Combination list.....40¢
Porcelain Head, Sargent's list.....50¢
Niles' Patent.....See Patents, Nails.
Nail Pullers—See Pullers, Nails.
Nail Sets—See Sets, Nails.
Nippers—See Pliers and Nippers
Nut Crackers—
 See Crackers, Nut.
Nuts—List Dec. 18, 1889.
 Cold Punched.....\$5.00
 Hot Pressed.....\$5.80
 In packages of 100 lb., add 1-10¢
 net; in packages less than 100 lb., add
 1/2¢ lb. net.

Oil Tanks—See Tanks, Oil.

Best or Government.....\$1.61
Navy.....\$1.42
U. S. Navy.....\$1.61
Oil Tanks—See Tanks, Oil.
Brass and Copper.....50¢
Zinc and Tin.....70¢
Broughton's Brass.....60¢
Broughton's Zinc.....60¢
Malleable Hammers, Improved, No. 1,
 \$3.80; No. 2, \$4.00; No. 3, \$4.40
 Malleable, Hammers' Old Pattern, same
 list.....60¢
Olmstead's Brass and Copper.....60¢
Olmstead's Tin and Zinc.....60¢
Nor's Pat. or "Paragon" Brass.....60¢
Prior's Pat. or "Paragon" Zinc.....70¢
Steel, Draper & Williams.....50¢
Willmot & Hobbs Mfg. Co., Steel Anti-
 Rust.....60¢

Openers, Can—

American.....\$1.75
Champion.....\$2.00
Domestic.....\$2.00
Duplex.....\$2.25
Eureka.....\$2.50
Excelsior, No. 1.....\$2.50
French, No. 4.....\$2.25
Iron Handle, No. 5.....\$2.50
Lyman's.....\$2.75
Messenger's Comet.....\$2.75
Moore's.....\$2.75
Sardine Scissors.....\$2.75
Sprague, No. 1, 5¢; 2, 6¢; 3, 6¢
Star.....\$2.75
Streeter's:
 Sensible, Japanned, per doz.....60¢
 Sensible, Nickel, per doz.....75¢
 Surprise, per doz.....25¢
 New Sprague, Metallic H'dle, per doz.....50¢
 New Sprague, Wood H'dle, per doz.....60¢
Universal.....\$2.00
World's Best.....\$2.00
No. 2, \$2.40; No. 3, \$3.00.....50¢

Packing, Steam—

Rubber—
 Standard, fair quality.....70¢
 Inferior quality.....75¢
Extra.....75¢
Jenkins' Standard.....80¢
N. Y. B. & P. Co., Double Diamond.....60¢
N. Y. B. & P. Co., Salamander.....45¢
N. Y. B. & P. Co., Carbon.....70¢
Miscellaneous—
 American Packing.....9¢
 Cotton Packing.....14¢
 Italian Packing.....12¢
 Jute.....6¢
 Russia Packing.....18¢

Pails—

Creamery—
 S. S. & Co., 15-qt., \$7.00; 20-qt., \$7.25
 \$ doz.....5¢

Galvanized Pails—

Light Heavy
 10 Quart.....\$2.00
 12 Quart.....2.25
 14 Quart.....2.50

Galvanized Buckets—

Fire Well
 10 Quart.....\$2.50
 12 Quart.....2.75
 14 Quart.....3.00

Indurated Fiber Ware

Fire Pails, deep.....\$4.80
Fire Pails, round bottom.....\$5.40
Milk, 14 qt......\$5.40
Stable, 14 qt......\$5.40
Star Pails, 12 qt......\$5.40

Standard Fiber Ware—

Buggy Pails.....\$3.00
Chamber Pails, 14 qt......6.00
Dairy Pails, 14 qt......3.75
Fire Pails, No. 1, 12 qt......3.75
Fire Pails, No. 2, 14 qt......4.25
Gorse Pails.....4.00
Sugar Jars (dual trap).....7.50
Slop Pails.....5.00
Water Pails, 12 qt......3.15

Pans—

Large sizes.....\$5
Small sizes.....\$5
Silver & Co. (Covered).....40¢

Fry—

Standard list:
 No. 1.....\$3.75
 No. 2.....\$4.25
 No. 3.....\$4.75
 No. 4.....\$5.25
 No. 5.....\$5.75
 No. 6.....\$6.25
 No. 7.....\$6.75
 No. 8.....\$7.25
 No. 9.....\$7.75
 No. 10.....\$8.25
 No. 11.....\$8.75
 No. 12.....\$9.25
 No. 13.....\$9.75
 No. 14.....\$10.25
 No. 15.....\$10.75
 No. 16.....\$11.25
 No. 17.....\$11.75
 No. 18.....\$12.25
 No. 19.....\$12.75
 No. 20.....\$13.25
 No. 21.....\$13.75
 No. 22.....\$14.25
 No. 23.....\$14.75
 No. 24.....\$15.25
 No. 25.....\$15.75
 No. 26.....\$16.25
 No. 27.....\$16.75
 No. 28.....\$17.25
 No. 29.....\$17.75
 No. 30.....\$18.25
 No. 31.....\$18.75
 No. 32.....\$19.25
 No. 33.....\$19.75
 No. 34.....\$20.25
 No. 35.....\$20.75
 No. 36.....\$21.25
 No. 37.....\$21.75
 No. 38.....\$22.25
 No. 39.....\$22.75
 No. 40.....\$23.25
 No. 41.....\$23.75
 No. 42.....\$24.25
 No. 43.....\$24.75
 No. 44.....\$25.25
 No. 45.....\$25.75
 No. 46.....\$26.25
 No. 47.....\$26.75
 No. 48.....\$27.25
 No. 49.....\$27.75
 No. 50.....\$28.25
 No. 51.....\$28.75
 No. 52.....\$29.25
 No. 53.....\$29.75
 No. 54.....\$30.25
 No. 55.....\$30.75
 No. 56.....\$31.25
 No. 57.....\$31.75
 No. 58.....\$32.25
 No. 59.....\$32.75
 No. 60.....\$33.25
 No. 61.....\$33.75
 No. 62.....\$34.25
 No. 63.....\$34.75
 No. 64.....\$35.25
 No. 65.....\$35.75
 No. 66.....\$36.25
 No. 67.....\$36.75
 No. 68.....\$37.25
 No. 69.....\$37.75
 No. 70.....\$38.25
 No. 71.....\$38.75
 No. 72.....\$39.25
 No. 73.....\$39.75
 No. 74.....\$40.25
 No. 75.....\$40.75
 No. 76.....\$41.25
 No. 77.....\$41.75
 No. 78.....\$42.25
 No. 79.....\$42.75
 No. 80.....\$43.25
 No. 81.....\$43.75
 No. 82.....\$44.25
 No. 83.....\$44.75
 No. 84.....\$45.25
 No. 85.....\$45.75
 No. 86.....\$46.25
 No. 87.....\$46.75
 No. 88.....\$47.25
 No. 89.....\$47.75
 No. 90.....\$48.25
 No. 91.....\$48.75
 No. 92.....\$49.25
 No. 93.....\$49.75
 No. 94.....\$50.25
 No. 95.....\$50.75
 No. 96.....\$51.25
 No. 97.....\$51.75
 No. 98.....\$52.25
 No. 99.....\$52.75
 No. 100.....\$53.25

Dust—

Steel Edge, No. 1.....\$1.75

Roasting and Baking—

Columbian, S. S. & Co., Nos. 10, 20,
 25, 30, \$2.50 each.....60¢

Paper and Cloth—

List April 19, 1888.....\$5.10
Sibley's Emery and Crocus Cloth.....30¢

Parers—Apple—

Advance.....\$4.25
Baldwin.....4.75
Bonanza.....5.00
Daisy.....5.50
Dandy.....5.50
Eclipse.....5.50
Eureka.....5.50
Favorite.....5.50
Gold Medal.....5.50
Ideal.....5.50
Improved Bay State.....5.50
Little Star.....5.50
Nomadic.....5.50
Norlighting.....5.50
Orion.....5.50
Penn......5.50
Perfection.....5.50
Reading 72.....5.50
Reading 78.....5.50
Rocking Table.....5.50
Turn Table.....5.50
Victor.....5.50
Waverly.....5.50
White Mountain.....5.50

Potato—

Antrim Combination.....\$5.50
Saratoga.....\$5.50
White Mountain.....\$5.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers.....50¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6
 to 7, \$13.00.....60¢

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Humason, Beckley & Co.'s.....70¢
Peck, Stow & W. Co......60¢
Sargent & Co.'s.....\$17 and \$18
 60¢ to 10¢

Escutcheon—

Brass.....70¢
Iron, list Nov. 11, 1885.....75¢

Pipe, Wrought Iron—

List April 13, 1893.
 1 1/2 and under, Plain.....57¢
 1 1/2 and under, Galv.....60¢
 1 1/2 and over, Plain.....67¢
 1 1/2 and over, Galv.....70¢
 2 and over, Galv.....75¢
 Boiler Tubes, list Oct. 24, 1892.....65¢
 Casing, list Nov. 16, 1892.....52¢
 Cold Drawn Seamless Steel Tubing.....50¢
 Inserted Joints Casing, list Nov. 16,
 1892.....47¢
 Steel Boiler Tubes.....27¢

Planes and Plane Irons—

Wood Planes—
 Molding.....50¢
 Bench, First quality.....55¢
 Bench, Second quality.....60¢
 Bailey's (Stanley R. & L. Co.).....60¢

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50¢
Birmingham Plane Co......60¢
Chaplin's Iron Planes.....50¢
Davis' Iron Planes.....50¢
Gage Tool Co.'s Self-Setting.....35¢
Miscellaneous Planes (Stanley R. & L.
 Co.).....25¢
Sargent's.....25¢
Standard Tool Co......50¢
Steers' Iron Planes.....50¢
Thistle.....30¢

Plane Irons—

Aburn Thistle.....30¢
Buck Bros......20¢
Fletcher's.....\$5.00
Handy.....30¢
Stanley R. & L. Co......50¢
L. & J. White.....25¢

Plates—

Felice.....\$1.00

Pliers and Nippers—

Barton's Patent.....60¢
Carew's Pat. Wire Cutters.....20¢
Cronk's 8 in., \$15.00; 10 in......60¢
Cronk's Button Pattern.....\$20.00
Cronk's Carrier Pliers.....60¢
Eureka Pliers and Nippers.....40¢
Gas Pliers.....40¢
Gas Pliers, Custer's Nickel Plated.....60¢
Hall's Nippers, No. 2, 5 in., \$13.50; No.
 4, 7 in., \$21.00
Hall's Pliers.....40¢
Humason & Beckley Mfg. Co......50¢
Lindsay's Giant, No. 55, 5 in......\$1.50
Morrill's Parallel.....\$12.00
P. S. & W. Cast Steel.....50¢
P. S. & W. Tinners' Cutting Nippers
 add 6¢
Russell's Parallel.....25¢
Waterbury Nips, 5 in......\$7.50

Plumbs and Levels—

Regular list.....75¢
Cook's.....40¢
Davis Inclinometers.....10¢
Davis Iron Levels.....30¢
Diamond's.....30¢
Pocket Levels.....70¢
Stanley's Duplex.....20¢
Stanley's Handy.....20¢

Poachers, Egg—

Buffalo Steam Egg Poachers.....\$1.00
No. 1, \$6.00; No. 2, \$9.00.....35¢
Silver & Co., 6-Ring.....\$4.00

Pokes Animal—

Bishop's American.....\$3.

Pullers Nail—
 Economy.....\$ doz., \$24.00, 40%
 Elrich.....\$ doz., \$5.50@6.00
 Giant, No. 1.....\$ doz., \$18.00, 10%
 Giant, No. 2.....\$ doz., \$15.00, 10%
 Pelican.....\$ doz., \$9.00, 25%
 Seranton.....\$ doz., \$18.00, 33%@33%
 10%

Pulleys—
 Brass Screw.....70%
 Hay Fork, "Anti-Friction," 5 in. solid.....50%
 Hay Fork, "F" Common and Patent.....20%
 Hay Fork, Moore's Anti-Friction 5 in. Wheel.....\$12.00.....40%
 Hay Fork, Reed's Self-Lubricating.....60%
 Hay Fork, Solid Eye, 4.00; Swivel, 4.50.....50%
 Hay Fork, Stearns' Nos. 35 & 45, 50%
 Hay Fork, Stearns' Nos. 15, 25, 50, 60, 80%
 Hay Fork, Tarred Rope.....60%
 Hot House, Awning, 100 ft.....70%
 Japanned Clothes Line.....60%
 Japanned Screw.....70%
 Japanned Side.....70%
 Moore's Ceiling or End, Anti-Friction 40%
 Moore's Dumb Waiter, Anti-Friction 50%
 Moore's Electric Light.....35%
 Moore's Side, Anti-Friction.....50%
 Sash (Auger Mortise).....60%
 Common Sense.....60%
 Empire.....60%
 Acme.....60%
 Ideal, Nos. 2, 4, 10 & 15.....60%
 Ideal, No. 10.....60%
 Ideal, No. 10.....60%
 On bbl. lots extra 5%
 Shade Rack.....45%
 Shepard's Niagara, No. 25, \$ doz 25%
 Tackle Blocks—See Blocks.

Pumps—
 Cistern, Beat Makers.....60%
 Pitcher Spout, Beat Makers.....70%
 Pitcher Spout, Cheaper G'ds.....70%
 Myers' Pumps, low list.....50%

Punches—
 Avery's Revolving.....40%
 Avery's Sawcut and Punch.....40%
 Bemis & Call Co.'s Cast Steel Drive.....50%
 Bemis & Call Co.'s Check.....50%
 Bemis & Call Co.'s Spring.....50%
 Bemis & Call Co.'s Springfield Socket.....50%
 Niagara Hollow Punches.....20%
 Niagara Solid Punches.....15%
 Rice Hand Punches.....15%
 Saddle's or Drive, good.....60%
 Spring, good quality.....\$ doz., \$2.50@2.60
 Spring, Leach's Pat.....15%
 Solid Tinner's, P., S. & W. Co., \$ doz., \$1.44.....55%
 Tinner's Hollow Punches, P., S. & W. Co.....20%

Rail—
 Barn Door, Light, In.....\$ 1.75 2.10 2.75
 Per 100 feet.....\$ 1.75 2.10 2.75
 B. D. for N. E. Hangers.....\$ 1.75 2.10 2.75
 Per 100 feet.....\$ 1.75 2.10 2.75
 Carrier, double braced, Steel Rail, 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Lundy Parlor Door, Planed Edge, 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Moody Steel Rail 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Moore's Steel Rail 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Sliding Door, Planed Edge, 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Sliding Door, Iron, Painted, 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Sliding Door, Wrt. Brass, 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Terry's Steel Rail 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75
 Victor Track Rail 3 ft. 6 in. foot.....\$ 1.75 2.10 2.75

Rakes—
 Cast Steel, Association G'ds.....70%
 Cast Steel, outside G'ds.....70%
 Malleable, good.....70%
 Malleable, low grade.....70%
 Fort Madison Frise Bow Brace and Peers.....65%
 Fort Madison Steel Tooth Lawn Rake.....\$ 6.00.....25%
 Gibbs.....\$ doz., \$4.90.....25%
 Gibbs' Acme Lawn Rake.....\$ doz., \$4.75.....25%
 Gibbs' Canton Lawn Rake.....\$ doz., \$3.75.....25%
 Gibbs' Crown Lawn Rake.....\$ doz., \$4.90.....25%
 Gibbs' Favorite Lawn Rake.....\$ doz., \$3.90.....25%
 Gibbs' Hustler No. 0.....\$ doz., \$4.25.....25%
 Gibbs' Hustler No. 1.....\$ doz., \$4.40.....25%
 Oneida Lawn Rake.....\$ doz., \$6.00.....25%

Razors—
 Campbell Cutlery Co.....50%
 Electric Cutlery Co.....Net prices
 Galvanic.....\$ doz., \$15.00
 Jordan's AAA, new list.....Net prices
 Jordan's Old Brand, new list.....Net prices
 E. B. Torrey Razor Co.....Net prices
 Wostenholm and Butcher, \$10 to 2.....10%

Razor Straps—
 See Straps, Razor.
Reels—
 Stearns'.....33%
 Fishing.....33%
 Hendryx Aluminum, German Silver, Gold, Bronze, Silver Rubber, Populio and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
 Hendryx Single Action Series, 102P and PN, 202P and PN, 102P and PN, 202P and PN, 502P and PN, 802 and 82N, 02084N, Competitor.....50%
 Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2004N, 2004P and PN, 02004P, 02024 and 02024N, 5009N and PN.....40%
Registers—
 Moore's Bronze Finishes.....70%
 Moore's Electroplated.....75%
 Moore's Japanned.....75%
 Moore's Solid Bronze.....65%
 Moore's Stone Pipe.....33%

Rings and Ringers—
 Bull Rings—
 Hotchkiss' low list.....40%
 Humason, Beckley & Co.'s.....75%
 Peck, Stow & W. Co.'s.....80%
 Sargent's.....80%
Hog Rings and Ringers—
 Ringers—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

Rivets and Burrs—
 Copper.....60%
 Unpainted Iron, Bed Brand.....60%
 Iron Norway, list Nov. 17 '87.....60%
 Second Quality.....70%

Rivet Sets—See Sets.
Roasting and Baking Pans—See Pans, Roasting and Baking.

Rods—
 Stair, Black Walnut.....\$ doz 40%
 Stair, Brass.....25%

Rollers—
 Acme Moore's Anti-Friction.....55%
 Barn Door, Sargent's list.....60%
 Moore's Barn Door Stay.....50%
 Union Barn Door Roller.....70%
 Thompson Mfg. Co.'s Lawn Rollers.....30%

Rope—The following prices are f.o.b. New York or factory; and are shaded 1/4% on large lots; terms, 1 1/2% for cash.
 Manila, 7-16 in. diam. and larger.....\$ 8 1/2 @ 8 1/2
 Manila, 1/4 and 5-16 in. diam. and larger.....\$ 8 1/2 @ 8 1/2
 Manila, Tarred Rope.....\$ 8 1/2 @ 8 1/2
 Manila, Hay Rope, Med'm.....\$ 8 1/2 @ 8 1/2
 Sisal, 7-16 in. and larger.....\$ 6 1/2 @ 6 1/2
 Sisal, 1/4 and 5-16 in. diam. and larger.....\$ 6 1/2 @ 6 1/2
 Sisal, Hay Rope.....\$ 6 1/2 @ 6 1/2
 Sisal, Tarred Rope.....\$ 6 1/2 @ 6 1/2
 Sisal, Medium Lath Yarn.....\$ 5 1/2 @ 5 1/2
 New Zealand.....\$ 5 1/2 @ 5 1/2
 New Zealand, 1/4 and 5-16 in. diam. and larger.....\$ 5 1/2 @ 5 1/2
 New Zealand, Hay Rope.....\$ 5 1/2 @ 5 1/2
 New Zealand, Tar'd Rope.....\$ 5 1/2 @ 5 1/2
 Cotton Rope.....\$ 12 @ 12
 Jute Rope.....\$ 5 1/2 @ 5 1/2

Wire—
 List February, 1892. All kinds.....50%

Rules—
 Boxwood.....\$ 80@100
 Ivory.....\$ 50@100
 Starrett's Steel Rules and Straight Edges.....25%

Sad Irons—See Irons, Sad.
Sand and Emery Paper and Cloth—
 See Paper and Cloth.

Sash Cord—See Cord, Sash.
Sash Locks—See Locks, Sash.
Sash Weights—
 See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
 Note.—Extra 5@10% often given.
 Atkins' Circular.....50%
 Atkins' Band.....50%
 Atkins' Cross Cut, new list.....40%
 Atkins' Mulan, Mill and Drag.....50%
 Atkins' One-Man Saw.....40%
 Atkins' Wood Saws.....40%
 Atkins' Hand, Compass, &c.....40%
 Dickinson's Circular.....45%
 Dickinson's Cross Cut, list Jan. 1, '93.....40%
 Dickinson's Hand.....25%
 C. E. Jennings & Co.'s.....25%
 Peace Circular and Mill.....45%
 Peace Cross Cut, list Jan. 1, '93.....45%
 Richardson's Circular and Mill.....45%
 Richardson's X Cut, list Jan. 1, '93.....45%
 Richardson's Hand, &c.....25%
 Simonds' Circular Saws.....45%
 Simonds' Crescent Ground Cross Cut Saws.....40%
 Simonds' One Man Cross Cut.....40%
 Simonds' Gang, Mill, Mulan and Drag.....45%
 Wheeler, Madden & Clemson Mfg. Co. Cross Cuts, list Jan. 1, 1893.....45%
 Cross Cut, Panel and Rip.....30%
 Woodrough & McFarlin.....45%
 Cross Cut, list Jan. 1, 1893.....45%
 Hand, Panel and Rip.....25%

Hack Saws—
 Eureka and Crescent.....25%
 Griffin's, complete.....40%
 Griffin's Hack Saw Blades.....40%
 Star Hack Saws and Blades.....25%

Scroll—
 Barnes' Builders' and Cab Makers'.....\$15.25
 Barnes' Scroll Saw Blades.....35%
 Lester, complete, \$10.00.....25%
 Rogers, complete, \$4.00.....25%

Saw Frames—
 See Frames, Saw.

Saw Sets—See Sets, Saw.
Saw Tools—See Tools, Saw.

Scale Beams—
 See Beams, Scale.

Scales—
 Chatillon's Eureka.....25%
 Chatillon's Favorite.....40%
 Chatillon's Grocers' Trip Scale.....30%
 Family Turnbills.....30%
 Hatch, Counter, No. 171, good quality.....\$ doz \$17.00@18.00
 Hatch Tea, No. 161.....\$ doz \$6.00@6.50
 Riehle Bros' Platform.....\$ 4@40%
 Union Platform Plain.....\$ 2.00@2.10
 Union Platform, Striped.....\$ 2.15@2.20
 Standard.....50%

Scissors, Fluting.....45%

Scrapers—
 Adjustable Box Scraper (S. R. & L. Co.).....\$ 8.00.....40%
 Box, 1 Handle.....\$ doz \$2.00
 Box, 2 Handle.....\$ doz \$3.00@3.40
 Peck and Box and Ship.....\$ 2.00@2.10
 Union Platform, Striped.....\$ 2.15@2.20
 Standard.....50%

Screen Window and Door Frames—See Frames

Screw Drivers—
 See Drivers, Screw

Screws—
Bench and Hand—
 Bench, Iron.....\$ 55@100
 Bench, Wood, Beech.....\$ doz \$2.25
 Bench, Wood, Hickory.....\$ 20@100
 Hand, Wood.....\$ 25@100
 Hand, Grand Rapids, list.....35%

Coach, Lag and Hand-Rail—
 Lag, Blunt Point, list Jan. 1, 1890.....\$ 80@100
 Coach and Lag, Gimlet Point, list Jan. 1, 1890.....\$ 80@100
 Hand Rail, Am. Screw Co.....\$ 75@100
 Hand Rail, E. & B. Mfg. Co.....\$ 75@100
 Hand Rail, Sargent's.....\$ 70@100

Jack Screws—
 Millers Falls.....\$ 50@100
 Millers Falls, Roller.....\$ 50@100
 Sargent.....\$ 70@100
 Stearns.....\$ 40@100

Cork—
 Detroit Cork Screw Co.....\$ 33%
 Humason & Beckley Mfg. Co.....\$ 40@100
 William's Forged Worm, Applewood Handle, \$ doz., \$5.00; Rosewood, \$5.50.....40%

Machine—
 Flat Head Iron.....70%
 Round Head Iron.....65%

Wood—
 List January 1, 1891.
 Flat Head Iron.....80%
 Round Head Iron.....75%
 Round Head Brass.....80%
 Flat Head Bronze.....80%
 Round Head, Bronze.....75%
 Rogers' Drive Screws.....\$ 82%
 Extra 10% often given.

Scroll Saws—See Saws, Scroll.

Scythes—
 See Scythes, Scythes.

Sets—
 Alken's Sets, Awns and Tools, No. 20, \$ doz \$10.00.....\$ 60@60%
 Common Brad Sets, No. 22, \$10.00; No. 43, \$12.50.....70@100%
 Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$7.....50%
 Henry's Combination Haft.....\$ doz \$6.50
 Millers Falls Adj. Tool Hds., No. 1, \$12; No. 4, \$12; No. 5, \$18.....25%
 Stanley's Electric.....\$ 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....30@100%

Nail—
 Round.....\$ gr. \$3.25
 Square.....\$ gr. \$4.00@4.25
 Buck Bros.....27%
 Cannon's Diamond Point.....\$ gr. \$12, 20%

Rivet—
 Regular list.....70%

Saw—
 Atkin's Criterion.....\$ doz No. 1, \$6.00
 Atkin's Genuine.....\$13.00, 50%
 Atkin's Imitation.....\$ doz \$3.00@3.25
 Atkin's Saw.....\$ doz No. 1, \$6.00
 Atkin's Saw and Punch.....60%
 Bemis & Call Co.'s Cross Cut.....\$ 80@85%
 Bemis & Call Co.'s Plate.....30%
 Common Lever.....\$ doz \$2.00, 45%
 Crescent.....\$ doz \$5.00
 Crescent (Keller), No. 1, \$15.00.....40%
 Dickinson's Star.....25%
 Hammer, Bemis & Call Co.'s new Pat. 45%
 Hammer, Hotchkiss.....\$5.50, 10%
 Hart's Pat. Lever.....20%
 Kohler's Giant Royal.....\$ doz \$12.00
 Kohler's Royal.....\$ doz \$7.00
 Leahy's Saws, No. 1, \$15.....15%
 Leopold.....\$ 40@100%
 Lloyd's Acme.....\$ doz \$15, 40%
 Morrill's No. 1, \$15.00.....40%
 Nos. 3 and 4, Cross Cut, \$23.00, 40%
 No. 5, Mill, \$31.00.....40%
 No. 10, \$15.00.....40%
 No. 11, \$16.00.....40%
 Nash's.....\$ 20@100%
 Stillman's Genuine.....\$ doz \$5.00@7.75, 40%
 Stillman's Pattern, Hand, \$ doz \$3.25; Cross Cut, \$5.50.....55%
 Taintor Positive.....\$ doz \$18, 65%

Sharpeners, Knife—
 Applewood Handles.....\$ doz \$6.00, 50%
 Rosewood or Cocobola.....\$ doz \$9.00, 50%
 Tanite Mills.....\$ gr. \$14.40, 25%
Shaves, Spoke—
 Iron.....45%
 Wood.....\$ doz \$1.00, 50%
 Bailey's (Stanley B. & L. Co.).....50%
 Cincinnati.....25%
 Goodell's.....\$ doz \$9.00, 25%
 Stearns.....40%

Shears—
 Acme Cast Shears.....\$ 10@100
 American Cast Iron.....\$ 10@100
 Barnard's Lamp Trimmers.....\$ doz \$3.75
 Barnard, Solid Steel Blade, Jap'd.....\$ 75%
 Barnard, Solid Steel Blade, Nicked.....65%
 Cast Steel Trimmers.....\$ 80@100
 First quality.....\$ 80@100
 Second quality.....\$ 80@100
 Campbell Cutlery Co., Jap'd.....\$ 65%
 Nickel Plated.....65%
 Claus brand, Japanned.....\$ 10@100
 Claus brand, Nicked, same.....\$ 10@100
 Clipper.....\$ 10@100
 Davenport, C. F. Co.....\$ 60@100
 Diamond Cast Shears.....\$ 10@100
 Galvanic 3/4 to 9 in. \$ doz \$1.00, 1 inch Hatch Cutlery Co. Solid Steel Forged.....\$ 60@100
 Heinisch's, List Dec. 1891.....\$ 60@100
 Heinisch's Tailor's Shears.....\$ 33%
 Howe Bros. & Hulbert, Solid Forged Steel.....\$ 40%
 Seymour's, List Dec. 1891.....\$ 60@100
 Victor Cast Shears.....\$ 75@100

Tinner's Snips—
 Cast Handles, Laid with Steel.....40%
 Niagara Snips and Shears.....\$ 20@100
 Wrt. Handles, Steel Blades.....\$ 12@100

Pruning Shears and Hooks
 Diston's Combined Pruning Hook and Saw.....\$ doz \$18.00, 10%
 Diston's Pruning Hook.....\$ doz \$12.00, 20%
 Dunlap's Saw and Chisel, \$ doz \$5.50, 30%
 Henry's Pruning Shears, \$ doz \$4.00, 25%
 Henry's Tree Pruner.....\$ 60@100
 E. S. Lee & Co.'s Pruning Tools.....\$ 50@100
 Levin Pruner No. 1, \$15.00 \$ doz. 40%
 Levin Pruner No. 2, \$21.00 \$ doz. 40%
 J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25
 Pruning Shears, Henry's Pat. \$ doz. \$3.00@3.25
 Pruning Shears, Conn. Pat. \$2.50@3.00
 P. S. & W. Co.....\$ 60%
 Wheeler, M. & C. Co., Combination.....\$ doz \$12.00

Tinner's, &c.—
 Shears and Snips (P. S. & W.).....\$ 20@25%
 Snips, J. Mallinson & Co.....\$ 33%

Sheaves—
 Corbin's, list.....\$ 60@100
 M. W. Co., list July, 1888.....\$ 50@100
 Moore's Anti-Friction.....50%
 Patent Roller.....\$ 60@100
 Patent Roller, Hatfield's.....\$ 75%
 R. & E., list Dec. 18, 1885.....\$ 55@60%
 Russell's Anti-Friction, list Dec. 18, 1885.....\$ 60@65%

Sliding Shutter—
 Reading list.....\$ 60@100
 R. & E., list Dec. 18, 1885.....\$ 60@100
 Sargent's list.....70%

Shells—
 Brass Shot Shells, Club, Rival, Climax, 1st quality.....\$ 60@65%
 1st quality, 4, 8, 10 and 12 gauge.....\$ 25@100%
 First quality Rival, Club and Climax brands, 14, 16 and 20 gauge (\$7.50 list).....\$ 20@100%
 Prize.....40%
 Smokeless brand, 12, 10, 16 gauge.....\$ 33%
 Star, Club, Rival and Climax Brands.....\$ 33%
 Trap brand, 12 and 10 gauge.....\$ 33%
Shells, Loaded—
 Standard list, July 19, 1890.....\$ 40@100
 2% cash, 10 days.

Ship Tools—
 L. & J. White.....\$ 20%
Shoes, Horse Mule, &c.—
 Horse—
 Burden's, Perkins' Phonix, Standard, Diamond State, Bryden's Boss and Crescent.....\$3.50@4.00
 Bryden's Frog Pressure, at factory.....\$5.00
 Add \$1 keg to above prices.

Ox Wrought—
 Ton lots.....\$ 90
 1000 lb lots.....\$ 90
 500 lb lots.....\$ 90

Shot—
 Drop, up to B, 25-b bag.....\$1.10
 Drop, up to B, 5-b bag.....30
 Drop, B and larger, 25-b bag.....1.35
 Drop, B and larger, 5-b bag......35
 Buck and Chilled, 25-b bag.....1.35
 Buck and Chilled, 5-b bag......35
 Dust Shot, 25-b bag.....1.75
 Dust Shot 5-b bag......40

Shovels and Spades—
 Ames' Shovels, Spades, &c., list Nov. 1, 1885 (Except Nos. named below).....20%
 The following Nos. are subject to discount of 27% to 57%: 648 to 880; and Nos. 1004, 1009, 1014, 1019, 1024, 1027 and 1029.....50%
 Griffith's Black Iron.....\$ 60@100
 Griffith's C. S.....\$ 60@100
 Griffith's Solid C. S. R. R. Goods.....20%
 Hubbard & Co., Anthracite Pattern.....25%
 Hubbard & Co.'s Chisholm Pattern.....50%
 Hussey, Blans & Co.....\$ 15@25%
 H. M. Myers Co.....30%
 Lehigh Mfg. Co.....\$ 50@100
 St. Louis Shovel Co.....\$ 20@20%
 Payne Pettibone & Son.....\$ 10@100
 Remington's (Lowman's) Pat. 40%
 Rowland's Black Iron.....\$ 50@100
 Rowland's Steel.....\$ 60@100
 Terre Haute Shovel & Tool Co.....25%

Shovels and Tongs—
 Brass Head.....\$ 60@100
 Iron Head.....\$ 60@100
Sieves and Sifters—
 A. & W. Sifters.....\$ gr \$15.00
 Buffalo Metallic, S. S. & Co.....\$ 50@25%
 Electric Light.....\$ doz \$1.50; \$ gr \$15.00
 Hunter's Genuine.....\$ doz \$1.75; \$ gr \$16.50
 Hunter's Imitation.....\$ doz \$1.75; \$ gr \$15.00
 Mann's Tin Rim.....\$ 50@25%
 Shaker (Barler's Pat.) Flour Sifters.....\$ gr \$31.00

Sieves, Wooden Rim—
 Mesh 18, Nested, \$ doz.....\$0.80 \$1.00
 Mesh 20, Nested, \$ doz......95 1.10
 Mesh 24, Nested, \$ doz.....1.15 1.25

Sinks—
 Standard list.....\$ 65@100
Wrought Steel—
 Columbus, galvanized and enameled.....50%
 Columbus Painted.....\$ 30@100
 New Era, Painted.....\$ 50@55%
 New Era Galvanized and Enameled.....70%
Skelps, Thimble—
 Western list.....\$ 75@75%
 Coldbrookdale Iron Co.....60%
 Columbus Wrt. Steel, Special net prices
 Seneca Falls Patterns.....75%
 Utica P. S. T. Skelps.....60%
 Utica Turned and Fitted.....35%

Slates—
 School, by case.....\$ 50@50%
 Large lots.....\$ 50@100
Slaw Cutters—See Cutters.

Sledge Hand—
 Tubular Steel.....\$ doz \$24.00, 40%
 Lots of 5 doz. 50%

Snap, Harness, &c.
Anchor T. & S. Mfg. Co. 50¢
Andrews 50¢
Cover's Saddlery Works' Triumph 39¢
Covered Spring 30¢
Cover 50¢
Cover, New Patent 50¢
Cover, New E. 50¢
Fitch's (Bristol) 50¢
German, new list 40¢
Hotchkiss 10¢
Kelley & Woolworth's Steel Harness 50¢
John Prots Snaps 70¢
Sargent's Patent Guard 70¢
Soythe 50¢

Snaths
Soythe 50¢

Soldering Irons
See *Iron, Soldering*.

Spittoons Cuspidors, &c.
Standard Fiberglass 50¢
Cuspidors, 2 1/2 inch, 5 doz, No. 5, 38; No. 52, 39
Spittoons, Daisy, 8 inch, No. 1, 1 10 and 11 inch, 36

Spoke Shaves
See *Shaves, Spoke*.

Spoke Trimmers
See *Trimmers, Spoke*.

Spoons and Forks
Tinned Iron 70¢
Basting, Cen. Stamp, Co's list 70¢
Buffalo, S. & Co. 39¢
Solid Table and Tea, Cen. Stamp, Co's list 70¢

Silver Plated
4 months or 5¢ cash 30 days:
L. Boardman & Son 50¢
Holmes & Edwards Silver Co. 40¢
Meriden Brit. Co., Rogers 40¢
Reed & Barton 40¢
Rogers & Bros. 40¢
C. Rogers & Bros. 40¢
Rogers & Hamilton 40¢
Wm. Rogers Mfg. Co. 40¢
Simpson, Hall, Miller & Co. 40¢

Miscellaneous
Boardman's Britannia Spoons, case lots 60¢
Boardman's Nickel Silver, list July 1, 1891 60¢
Britannia 60¢
German Silver 60¢
Nickel Silver 60¢
Holmes & Edwards Silver Co. 60¢
No. 24 German Silver 50¢
No. 30 Silver Metal 50¢
No. 49 Nickel Silver 50¢
No. 50 Nickel Silver 50¢
No. 97 Mexican Silver 50¢
Rogers & Hamilton 40¢
Cimeter, Flatware 40¢
Cimeter, Steel Goods 40¢
Crown Hamilton, Flatware and Cutlery 30¢
Steel Goods 40¢
Wm. Rogers Mfg. Co. 60¢
18¢ Rogers' German Silver 60¢
22¢ Rogers' Nickel Silver 60¢
Rogers' Silver Metal 60¢

Springs Door
Champion (Col.) 55¢
Cowell's, No. 1, 5 doz 18.00, No. 2, 15.00
Gem (Col.), list April 19, 1886 20¢
Hercules 33¢
Phenix 33¢
Rubber, complete, 5 doz 15.00, 6 doz 17.00
Star (Col.), list April 19, 1886 20¢
Torrey's Rod, 39 in 12.00, 48 in 15.00
Warner's No. 1, 5 doz 15.00, No. 2, 3.40
Victor (Col.) 60¢

Carriage Wagon &c.
Eliphe, Concord, Platform and Roll 60¢
Olin's Roller Springs 25¢

Sprinklers, Lawn
Gibbs Arc 50¢
Gibbs Hustler 50¢

Squares
Nickel Plated 85¢
Steel and Iron 85¢
Try Square and T Bevels 60¢
Avery's Bevel Protractor 60¢
Avery's Flush Bevel Squares 40¢
Dixon's Try Square and T Bevels 50¢
Starrett's Micrometer Caliper Squares 25¢
Winterbottom's Try and Miter 30¢

Squeezers
Fodder 50¢
Blair's 50¢
Blair's "Olimax" 50¢

Lemon
Porcelain Lined, No. 1 50¢
Wood, Common 50¢
Wood, No. 2 50¢
Dean's No. 1 50¢
Dunlap's Improved 50¢
Hotchkiss Straight Flash 50¢
Jennings' Star 50¢
King 50¢
Little Giant 50¢
Mammis No. 1, 50¢; No. 2, 49¢
The Boss 50¢

Standard Fiber Ware
See *Fiber, Standard*.

Staples
Barbed Blind, 1/2 in. and larger 70¢
Barbed Blind, 3/4 in. 80¢
Fence Staples, Galvanized, Same Price
Fence Staples, Plain, Same Price
Grand Crossing Tack Co.'s list 75¢
C. & A. Hoffmann's 40¢
Nichols Bros 40¢

Steels Butchers
Blacksmith's 40¢
Butterfield's Goods 35¢
Waterford Goods 35¢
Gardner 35¢
Green River 35¢
Lightning Screw Plate 35¢
Reese's New Screw Plate 35¢
Reversible Ratchet 35¢

Stones
Stones, Grind-See *Grindstones*.
Soythe Stones 35¢
Pike Mfg. Co., list April, 1892 35¢
Iceland Stone Co., list Nov 1892 35¢

Oil Stones, &c.
Pike Mfg. Co.
Hindstone No. 1, 1 doz 40¢
Sand Stone 40¢
Turkey Oil Stone, 4 to 8 10¢
Turkey Slips 20¢
Lily White Washita 60¢
Rogers Red Washita 60¢
Washita Stone, Extra 50¢
Washita Stone, No. 1 40¢
Washita Stone, No. 2 30¢
Lily White Slips 30¢
Rogers Red Slips 30¢
Washita Slips, Extra 30¢
Washita Slips, No. 1 30¢
Arkansas Stone, No. 1, 3 to 5 in 30¢
Arkansas Stone, No. 1, 5 to 8 in 30¢
Lake Superior 30¢
Lake Superior Slips 30¢
Tantite Mills 30¢
Emery Oil 30¢

Stops, Bench
Cincinnati 25¢
Crescent 50¢
Hotchkiss 50¢
McGills 50¢
Millers Falls 50¢
Morrill's 50¢
Stearns 50¢
Terrell's Nos. 1 and 2, 5 doz, 38; No. 3, 38.60
Weston's, No. 1, 10.00; No. 2, 9.25; 10.50

Stove Polish
See *Polish, Stove*.

Stretchers Carpet
Cast Steel, Polished 75¢
Socket 75¢
Bullard's 75¢

Strops Razor
Badger's Belt and Com. 50¢
Campbell Cutlery Co. Net prices
Electric Cutlery Co. Net prices
Gemline Emerson 60¢
Imitation 50¢
Jordan's Pat. Padded, list Nov. 1, '89, 50¢
Lamont Combination 50¢
Torrey's 50¢

Stuffer Sausage
Miles' Challenge, 50¢
Perry, 50¢
22.00, 50¢
Draw Cut No. 4, each 30.00, 20¢
Enterprise Mfg. Co., list Jan 17, '93, 25¢
Silver's 40¢

Sweepers, Carpet and Lawn
Aome 50¢
Advance 50¢
Banner Jap'd, 50¢
Grand 50¢
Gold Medal 50¢
Prize 50¢
Superior 50¢
Cosmopolitan 50¢
Furniture Protector, Nickel 50¢
Inter Ocean 50¢
Hall 50¢
Crown Jewel, No. 1, 18.00; No. 2, 19.00; No. 3, 20.00
Domestic 50¢
Dunlop's No. 1, 50¢
Easy Jap'd, 50¢
Excelior 50¢
Garland 50¢
Gilt Edge 50¢
Grand Rapids 50¢
Grand Republic 50¢
Imperial 50¢
Improved Parlor Queen 50¢
Jannaped 50¢
Nickel 50¢
Ladies' Friend 50¢
Ladies' Friend No. 2 50¢
Parlor Queen 50¢
Our Leader 50¢
Our Own 50¢
Rapid Jap'd, 50¢
Refiable 50¢
Select 50¢
Standard 50¢
Supreme 50¢
The Star 50¢
Tirumh 50¢
Bissell Carpet Sweeper Co. make the following rebates:
\$1.00 per doz. in 5 doz. lots.
\$.20 per doz. in 10 doz. lots.

Swings
Thompson Mfg. Co. 80¢
Davies Lawn 25¢

Tacks, Brads &c.
List October 19, 1889. Old established straight weights. Short Weight goods are sold at lower prices.
Carpet Tacks:
American, Blued 47¢
American, Tin'd and Cop'd 52¢
Steel, Bright and Blued 47¢
Steel, Tinned and Coppered 52¢
Swedes Iron, S. S. Blued 47¢
Swedes Iron, S. S. Tinned 47¢
American Iron Tacks, Domestic 37¢
American Iron Tacks, Foreign 50¢
Swedes Iron Tacks:
S. S. Blued 37¢
S. S. Tinned 45¢
Lanc. Blued 37¢
Lanc. Tinned 47¢
Upholsterers' S. S. 47¢
Upholsterers' Lanc. 37¢
Gimp Tacks:
S. S. Blued 30¢
S. S. Tinned 42¢
Lanc. Blued 20¢
Lanc. Tinned 35¢
Basket and Trimmers' Tacks:
Lanc. 20¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 5¢
Brush Tacks and Nails 5¢
Looking Glass Tacks, S. S. 5¢
Picture-Frame Points, S. S. 12¢
Lace Tacks Blued 12¢
Lace Tacks, Tinned 20¢
Finishing Nails 52¢
Trunk and Clout Nails:
Blued 52¢
Tinned or Coppered 57¢
Basket Nails 97¢
Chair Nails 85¢
Olgar Box Nails 80¢
Tin Capped Nails 50¢

Miscellaneous
Double Point 85¢
Wire Carpet Nails 85¢
Bill Nye Brad Box 40¢
Bonnie Blue 50¢
Claw Handle Carpet 50¢
Home Tacks, No. 50 50¢
Home Tacks, No. 100 100¢
Home Nails, No. 200 200¢
Home Nails, No. 400 400¢
Parisian Gilt Nails, cartoon 50¢
Plymouth Rock Carpet Tacks 30¢
Upholsterers' Nails 50¢

Wire Brads and Nails
Steel-Wire Brads, R. & E. Mfg. Co.'s list 50¢
See also *Nails, Wire*.

Tanks Oil
Emerald, S. S. & Co.: 30-gal. \$2.75; 60-gal. \$5.00; 100-gal. \$7.50

Tapes, Measuring
American 10¢
Chermerman's, Regular list 30¢
Excelior, Special list 20¢
Spring 40¢

Thermometers
Tin Case 80¢

Thimble Skelns
See *Skelns, Thimble*.

Ties Bale
Standard Wire list 50¢

Tinners' Shears, &c.
See *Shears, Tinners' &c.*

Tinware
Stamped, Japanned and Placed, list Jan 20, 1893 70¢

Tie Benders, Upsetters, &c.
See *Benders and Upsetters*.

Tobacco Cutters
See *Cutters, Tobacco*.

Tools Coopers
Albertson Mfg. Co. 25¢
Barton's 20¢
Beatty's 33¢
Bradley's 20¢
Sandusky Tool Co. 30¢
Shaves Cincinnati Tool Co. 20¢
L. & J. White 20¢

Lumber
Cant Hooks, "Blue Line" 50¢
Cant Hooks, Common Finish 50¢
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish 50¢
Cant Hooks, Mail Socket Clasp, Common Finish 50¢
Cant Hooks, Clip Clasp, "Blue Line" Finish 50¢
Cant Hooks, Clip Clasp, Common Finish 50¢
Hand Spikes 50¢
Pike Poles, Pike & Hook 50¢
Pike Poles, Pike only 50¢
Pike Poles, 12 ft. 50¢
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Silver Plated, Hollow-
4 mo. or 5 % cash in 30 days.
Meriden Britannia Co. 40¢
Reed & Barton. 40¢
Rogers & Brother. 40¢
Simpson, Hall, Miller & Co. 40¢
Hartford Silver Plate Co. 40¢
William Rogers Mfg. Co. 40¢

Washers—

Size hole. 5-16 3/4 1/2 5/16 1/4
Washers. 5/4 4/4 3/4 2/4
In lots less than 2000, 5¢, add 1/4¢, 5-3
boxes 1¢ to list.

Whips

American Whip Co.	Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving		\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	\$6.00
Eureka, Two-thirds Whalebone					15.00	16.50	18.00	20.00	
Bull Bone, Half-length Whale									
bone.				11.00	12.00	13.00	15.00		
American Standard.		8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.		6.00	6.00	6.50	7.00	7.50	8.00		
New Name, Stocked Java, Black									
and Wire Colors.									
Americana, 93 Pen Whip.									
Gents' Light Driving No. 111.									
Gents' Light Driving No. 106.									
Hand-made Stocked Java No. 103.				3.75	4.00				
A large variety of cheaper grades.									
Team Whips.									
Toy Whips.									
Hardware Assortment, 10/American, 75 Whips for \$50.00.									

Wire and Wire Goods—**Iron—**

Market,

Washer Cutters—

See Cutters, Washers.

Water Coolers—

See Coolers, Water.

Wedges—Iron. 2¢
Steel. 3¢**Weights Sash**

Ton lots at foundry, 1/2 ton, \$15.00; 1 lb. 16

Well Buckets Galvan-

ized—See Falls, Galvan-

Wheels Well

8 in. \$2.00; 10 in. \$2.50; 12 in. \$2.75

Br. & Ann., Nos. 0 to 18. 5¢
75¢ to 10¢
Cord'd, Nos. 0 to 18, 75¢ to 10¢
Galv., Nos. 0 to 18. 70¢ to 10¢
Tin'd, Nos. 0 to 18. 70¢ to 10¢Extra 5¢ to 10¢
often given
and low net
prices often
made on
large lots.**Stone,**

Br. and Ann'd,

Nos. 16 to 18. 80¢
Nos. 19 to 20. 80¢
Nos. 21 to 22. 80¢Extra 10¢
often given.**Annealed Wire or Spool.**Brass, list Jan. 18, 1894. 40¢
Cast Steel Wire. 50¢Copper, list Jan. 18, 1894. 40¢
Galvanized Fence. 75¢ to 10¢Main's An'led & Tin'd on Spools. 60¢ to 75¢
Main's Brass and Cop. on Spools. 50¢ to 60¢

Steel Music Wire, 12 to 30, imported. 60¢ to 70¢

Stub's Steel Wire. \$6.00 to 2, 30¢
Tate's Spooled, Tin'd & Annealed. 60¢ to 70¢Tate's Spooled, Cop. and Brass. 50¢
Tined Broom Wire, 18 to 21, 1/2 in. 4¢

Wire Clothes Line, see Lines.

Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list. 90¢ to 10¢

Wire Cloth and Netting—

Galvanized Wire Netting. 80¢ to 10¢

Painted Screen Cloth 100 ft \$1.45 to \$1.60

Wire Barb—

See Trade Report.

Wire Rope—See Rope, Wire.**Wrenches—**

American Adjustable. 4¢ to 10¢

Baxter's Adjustable "S". 40¢ to 10¢

Baxter's Diagonal. 60¢ to 10¢

Coe's Genuine. 50¢ to 10¢

Coe's "Mechanics". 50¢ to 10¢

Girard Standard. 65¢ to 10¢

Lamson & Sessions' Engineers'. 60¢ to 10¢

Lamson & Sessions' Standard. 70¢ to 10¢

Girard Agricultural.

Lamson & Sessions' Agric'l. 75¢ to 10¢

P. S. & W. Agricultural. 80¢ to 10¢

W. & B. Diamond. 50¢ to 10¢

Acme, Bright. 40¢ to 10¢

Acme, Nickle. 40¢ to 10¢

Alken's Pocket (Bright). 50¢ to 10¢

Alligator. 40¢ to 10¢

Always Ready. 30¢ to 10¢

Bemis & Call's.

Adjustable S. 35¢ to 10¢

Brigg's Pattern. 30¢ to 10¢

Combination Black. 40¢ to 10¢

Combination Bright. 40¢ to 10¢

Cylinder or Gas Pipe. 45¢ to 10¢

Extra Heavy. 45¢ to 10¢

Merrick's Pattern. 45¢ to 10¢

No. 3 Pipe Bright. 55¢ to 10¢

Bit Wrench, Adj., Tatum's. \$2.25 to 25¢ to 10¢

Boardman's. 30¢ to 10¢

Cincinnati Brace Wrenches. 20¢ to 10¢

Diamond Steel. 55¢ to 10¢

Donohue's Engineer. 20¢ to 10¢

Eagle. 50¢ to 10¢

Gardner's. 70¢ to 10¢

Taft's Vice Wrench. 55¢ to 10¢

The Favorite Pocket. 40¢ to 10¢

Walker's. 55¢ to 10¢

Webster's Pat. Combination. 25¢ to 10¢

Wringers, Clothes

Am. Wringer Co.'s list July 2, 1894. 2¢ cash

Colby Wringer Co.'s list May 1, 1894. 2¢ cash

Lovell Mfg. Co.'s list July 1, 1892. 2¢ cash

Peerless Mfg. Co.'s list Feb., 1892. 2¢ cash

National Wringer & Mfg. Co., list

June 1, 1892. 2¢ cash

Wrought Goods—

Staples, Hooks, &c., list, March 17, 1893

85¢ to 2¢ to 85¢ to 3¢

Animal and Vegetable**Oils—**

Linseed, City, raw. per gal.	54	55
Linseed, City, boiled.	57	58
Linseed, Western, raw.	55	56
Lard, City, Extra Winter.	55	56
Lard, City, Prime.	53	54
Lard, City, Extra No. 1.	48	49
Lard, City, No. 1.	45	46
Lard, Western, prime.	52	53
Cotton-seed, Crude, prime.	28	29
Cotton-seed, Crude, off grades.	26	27
Cotton-seed, Summer Yellow, prime.	28	29
Cotton-seed, Summer Yellow, off grades.	30	31
Sperm, Crude.	60	61
Sperm, Natural Spring.	60	61
Sperm, Bleached Spring.	65	66
Sperm, Natural Winter.	65	66
Sperm, Bleached Winter.	70	71
Whale, Crude.	40	41
Whale, Natural Winter.	40	41
Whale, Bleached Winter.	45	46
Whale, Extra Bleached.	47	48
Sea Elephant, Bleached Winter.	25	26
Menhaden, Crude, Sound.	25	26
Menhaden, Crude, Southern.	25	26
Menhaden, Light Pressed.	30	31
Menhaden, Bleached W'ter.	35	36
Menhaden, Extra Bleached.	37	38
Tallow, City, prime.	38	39
Tallow, Western, prime.	40	41
Cocoonut, Ceylon.	64	65
Cocoonut, Cochiti.	74	75
Cod, Domestic.	34	35
Cod, Foreign.	36	37
Red Elaine.	35	36
Red Saponified.	44	45
Bank.	28	29
Strait.	29	30
Olive, Italian, bbls.	56	57
Neatsfoot, prime.	60	61
Palm, prime, Lagos.	54	55

Mineral Oils—

Black, 20 gravity, 25 @ 80	
cold test. per gal	7 3/4
Black, 20 gravity, 15 cold	
test.	7 3/8
Black, 20 gravity, summer ..	5 1/2 @ 6 1/4

Cylinder light, filtered.	12	16
Cylinder, dark, filtered.	10	13
Paraffine, 23 1/2 @ 24 gravity.	11	12
Paraffine, 25 gravity.	10	11
Paraffine, 28 gravity.	7 1/2 @ 8	
Paraffine, red.	9 1/2 @ 10 1/2	

Paints and Colors—

Barytes, Foreign, 10 ton.	\$22.00	\$24.00
Barytes, Amer. floated.	29.00	\$32.00
Barytes, Amer. No. 1.	16.00	\$18.00
Barytes, Amer. No. 2.	13.00	\$15.00
Barytes, Amer. No. 3.	11.00	\$12.00
Blue, Celestial.	7 1/2	8
Blue, Chinese.	6	8
Blue, Prussian.	25	40
Blue, Ultramarine.	8	25
Brown, Spanish.	3	1
Brown, Vandyke.	3 1/2	3 1/4
Carmine, No. 40, in bulk.	2.00	3
Carmine, No. 40, in boxes		
or barrels.	2.10	3
Carmine, No. 40, in ounce		
bottles.	3.00	4
Chalk, in bulk.	70¢	2.00
Chalk, in bbls. 100 lb.	88	40
China Clay, English.	13.00	\$18.00
Cobalt Oxide, prep'd.	9.00	\$11.00
Cobalt Oxide, black.	1.90	2.00
Cobalt Oxide, black, less 100 lb.	1.96	2.00
Green, Paris, in bulk.	23	23
Green, Paris, 170 @ 175 lb.	23 1/2	23 1/2
Green, Paris, small pack.	25	23 1/2
Rebates.	24	23 1/2
over: 2 1/2 @ 4000 to 10,000 lb or		
2000 to 4000 lb. 1 1/2 @ 1000 to 2000 lb.		
1 @ 500 to 1000 lb purchased during		
the season.	6	12
Green, Chrome, ordinary.	22	25
Green, Chrome, pure.	22	25
Lead, Eng. B.H. white.	7	8
Lead, Ann. White.	4 1/2 @ 4 3/4	5 1/2 @ 6 1/4
Lead, White, in oil, 25 lb tin		
pails, add to keg price.	1 1/2	1 1/2
Lead, White, in oil, 12 1/2 lb tin		
pails, add to keg price.	1	1
Lead, White, in oil, 1 to 5 lb		
sorted tins, add to keg price.	2 1/4	2 1/4

Lead, Red, bbls. and 1/2 bbls.	5 1/2 @ 5 1/2
Lead, Red, kegs.	5 1/2 @ 6
Litharge, kegs.	5 1/2 @ 5 1/2
Litharge, bbls. and 1/2 bbls.	5 1/2 @ 6
Ocher, Chinese.	1.35 @ 1 1/2
Ocher, French Washed.	1 1/2 @ 2 1/2
Ocher, German Washed.	1 1/2 @ 3
Ocher, American.	1 1/2 @ 1 1/2
Orange Mineral, English.	7 1/2 @ 8
Orange Mineral, French.	10 @ 10 1/2
Orange Mineral, German.	7 1/2 @ 8
Orange Mineral, American.	7 1/2 @ 8
Red, Indian, English.	5 @ 15
Red, Indian, American.	2 @ 5
Red, Turkey.	9 @ 14
Red, Venetian.	7 @ 10
Red, Venetian, American.	7 @ 10
Red, Venetian, English.	100 lb. 70 @ 1.00
Sienna, Italian, Burnt and	
Powd.	1.10 @ 1.35
Sienna, Ital., Burnt Lumps.	4 @ 5
Sienna, Ital., Raw, Powd.	1 1/2 @ 3 1/2
Sienna, Ital., Raw, Lumps.	4 1/2 @ 5 1/2
Sienna, American, Burnt and	
Powd.	1 1/2 @ 1 1/2
Talc, French.	1 1/2 @ 1 1/2
Talc, American.	1 @ 1 1/2
Terra Alba, Fr'ch. 100 lb.	65 @ 75
Terra Alba, English.	65 @ 75
Terra Alba, American No. 1	
65 @ 75	
Terra Alba, American No. 2	
45 @ 50	
Umber, Turkey, Burnt and	
Powd.	2 1/2 @ 3 1/2
Umber, Turkey Bnt. Ln.	2 1/2 @ 3
Umber, Turkey, Raw and	
Powd.	2 1/2 @ 3 1/2
Umber, Turkey, R'w Lumps	
1 1/2 @ 2 1/2	
Umber, Turkey, R'w Amer.	1 1/2 @ 1 1/2
Yellow, Chrome.	10 @ 25
Vermilion, American Lead.	11 @ 12
Vermilion, Quicksilver, bulk.	43 @ ..
Vermilion, Quicksilver, bags.	44 @ ..
Vermilion, Quicksilver sm'r	
pkgs.	52 @ 60
Vermilion, English Import.	55 @ 60
Vermilion, Imitation, Eng.	8 @ 30
Vermilion, Trieste.	90 @ 95
Vermilion, Chinese.	85 @ 1.00
Whiting Common, 100 lb.	40 @ 45
Whiting Gliders.	60 @ 55
Zinc, American, dry.	3 1/2 @ 4 1/2
Zinc, French, Red Seal.	7 @ 7 1/2

Zinc, French, Green Seal.	8 1/2 @ 9
Zinc, French, V. M. X.	8 @ 9
Zinc, Antwerp, Red Seal.	8 @ 9
Zinc, Antwerp, Green Seal.	8 1/2 @ 9
Zinc, German, L. Z. O.	8 @ 9
Zinc, V. M. in Poppy Oil, G.	
Seal, lots of 1 ton and	
over.	10 1/2 @ ..
lots less than one ton.	11 @ ..
Zinc, V. M. in Poppy Oil,	
Red Seal.	10 1/2 @ ..
lots of 1 ton and over.	10 1/2 @ ..
lots of less than 1 ton.	10 1/2 @ ..
DISCOUNTS.—French Zinc.—Discounts to	
buyers of 10 bbl. lots of one or assorted	
grades, 1 1/2 %; 25 bbls. 2 %; 50 bbls. 4 %. No	
discount allowed on less than bbl. lots.	

Colors in Oil—

Black, Drop, Frankfurt.	25 @ 80
Black, Drop, English.	12 @ 15
Black, Drop, Domestic.	7 @ 10
Black, Lampblack, Best.	20 @ 35
Black, Lampblack, Common.	

JULY 25, 1894.

IRON AND STEEL— Bar Iron from Store—

Merchant Steel from Store

Soft Steel Sheets.

Sheet Iron from Store—

Russia, Planished, &c.

Galvanized.

Foreign Steel from Store—

METALS—

Tin Plates—

Charcoal Plates—Bright—

Coke Plates—Bright

Charcoal Plates—Terre

Tin Boiler Plates—
110 sheets

American Terne Plates.—Ap

Ingot—

Sheet and Bolt-

Net

Bolt Copper, $\frac{3}{8}$ inch diameter and over, $\$$ D, 14¢.
Circles, Segments and Pattern Sheets, 60 in. diameter
and less, 3¢ $\$$ D advance over prices of Sheet Cop-
per required to cut them from.

Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ~~per~~ lb advance over prices of Sheet Copper required to cut them from.

Copper Bottoms, Pits and Flats—

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinned..... \$ 34¢, 15 % @ 25 %
Tinning-

Planished Brass and Copper—
Not larger than 30 x 60.

12 oz..... 27¢ 3/4

Seamless Brass Tubes—

Copper Bronze and Gilding Tube, 3¢ per lb additional.
Braze Brass Tubing. (To No. 19 inclusive.)
Brown & Sharpe's gauge standard.

Smaller than 1/8 inch.....	Spec
3/8 inch and larger	Spec
2 inch to 3 inch, to No. 19 inclusive.....	\$0.
Bronze and Copper, advance on Brass List, 3 cents.	
Discount from list.....	4

(Brown & Sharpe Standard Gauge.)

* Special price not less than 80 cents.
Discount from List 40 %.

List April 9, 1894.

Discount, 40 %.
Spring Wire, 2¢ @ in advance.

	Per lb.		Per lb.
No. 5.....	49¢	No. 11.....	56¢
No. 6.....	49¢	No. 12.....	58¢
No. 7.....	49¢	No. 13.....	60¢
No. 8.....	50¢	No. 14.....	65¢
No. 9.....	52¢	No. 15.....	70¢
No. 10.....	54¢		
60% @ 5% discount.			

<i>Drawn Rods for Bolts, Forgings, &c.</i>	
$\frac{1}{4}$ to $3\frac{1}{2}$ inches inclusive.....	17¢
Over $3\frac{1}{2}$ to 5 inches inclusive.....	18¢
<i>Piston Rods, Finished True, Smooth and Straight.</i>	
$\frac{1}{4}$ to $3\frac{1}{2}$ inches inclusive.....	18¢
Over $3\frac{1}{2}$ to 5 inches inclusive.....	19¢

Duty: Pig, Bars and Plates, \$1.50 @ 100 lb. 41 1/2
Western Spelter..... 8¢ @ 8 1/2
Bertha (pure).....

Zinc—

600 b casks.....	61
Per b.....	61

Duty: Pig, \$2 ½ 100 lb. Old Lead, 2¢ ½ lb. Pipe and	
Sheets, 2½¢ ½ lb.	
American Pig	3½¢ @ 100 lb.
Bar	1½¢
Pipe, subject to discount 20 %	5½¢
Tin Lined Pipe, subject to discount 20 %	5½¢
Block Tin Pipe, subject to discount 20 %	35¢
Sheet, subject to discount 20 %	6½¢
Old Lead in exchange, 2½¢ ½ lb.	

1/2 @ 1/2	13 1/2¢ @ 14
No. 1	11 1/4¢ @ 12 1/4

Prices of Solder Indicated by private brands vary according to composition.

Cookson.....	39	10 1/2
Hallett's.....	39	10

Duty: 15¢ per lb.

No. 1 Aluminum (guaranteed over 98 % pure), in rolling ingots:		
Small lots	3¢ lb 6
10-lb lots	3¢ lb 6
Ton lots	3¢ lb 6
No. 1 Aluminum (guaranteed to be over 98 % pure),		

Small lots.....	50	50	50
100-lb lots.....	50	50	50
Ton lots.....	50	50	50
No. 2 grade (guaranteed to be over 94 % pure aluminum), cast in ingots for remelting:			
Small lots.....	50	50	50
100-lb lots.....	50	50	50
Ton lots.....	50	50	50

<i>Dealers' Purchasing Prices Paid in New York.</i>	
Heavy Copper.....	39 1/2 7

Light Brass.....	gross ton	4
Lead.....	gross ton	3
Tea Lead.....	gross ton	2
Zinc.....	gross ton	2
No. 1 Pewter.....	gross ton	1
No. 2 Pewter.....	gross ton	6
Wrought Scrap Iron.....	gross ton	88
Heavy Cast Scrap.....	gross ton	7
Stove Plate Scrap.....	gross ton	3
Burnt Iron.....	gross ton	2

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